

# INSECT SINGERS

## CHAPTER I

### INTRODUCTION

MANY vagaries attend the meaning of the term "bug." It was originally from a Celtic name for "ghost" or "goblin," but the more materialistic Nordic came to apply it solely to those more corporeal though still nocturnal presences which haunt lodging-houses of the less superior kind and are referred to in polite society only by periphrasis.

Across the Atlantic this neat and expressive term of vigorous horror and disgust has been degraded to a mere synonym of "insect." In the United States even a butterfly is a "bug."

The entomologist has taken a middle course. To him "bugs" are all those insects which share with the London or bed-bug the possession of mouth-parts constructed for piercing and sucking, and develop like it by stages in which the young quite strongly resemble smaller editions of the parent. The result is a vast course of varied forms restricted by their own make-up to a liquid diet, but adapted in a thousand ways to exploit every form of liquid refreshment from plant sap to animal blood which Nature offers. Scientifically speaking then these, and these only, are bugs or *Hemiptera*.

The élite of this bibulous assemblage are the cicadas. Haldane has signalized the café as one of the greatest civilizing institutions of European culture. Art and alcohol have never been incongruous terms. It will therefore not surprise us to find the greatest musical artists of the insect world among its deepest drinkers.

Their sudden appearance in the hottest season of the year, their mysterious feeding-habits, and above all the striking musical performances of cicadas have attracted the attention and intrigued the imagination of man from the earliest times of which we have any other than palaeontological record. In countries where these insects commonly occur the concept "cicada" corresponds to a primary insect category comparable to that of "fly," "beetle," and "butterfly." Allusions to cicadas in literature, references to them in folk-lore, and representations of them in art are therefore

almost always easily recognizable. In modern times these noisiest of all invertebrate animals have attracted considerable attention from travellers and naturalists on account of their song, from general anatomists through the wonderful mechanism of the sound-organs and from the public generally by the unexampled length of the life-history of certain species and by their periodical appearance in vast swarms. Finally, their similarity to man in the relative development of the different senses, with sight and hearing easily first and second—and their behaviour in relation to the elaborate songs of the males—invests them with a peculiar interest to the comparative psychologist and general philosopher, and renders them unique among non-social insects.

There is most ancient precedent and high modern philosophical authority for looking to the ants as in many respects the paradigm of social beings. "Folk-lore and primitive poetry and philosophy show the ants as an abiding source of similes expressing the fervid activity and co-operation of men." They command a cool intellectual admiration for the organized thoroughness with which the individual is subordinated to the needs of that super-organism—the community as a whole. But when men shall have been cured of the disease which some call metaphrenia and others civilization, when they shall have ceased their "special and devout worship of a strange god whom they call Progress" and shall have turned once more to Pan and Orpheus and the art of living, then will they see in the cicadas living exemplars of the otherwise fictitious "noble savages" of Rousseau and will understand why the Greeks hailed these insects as the favourites of the Muses.

## CHAPTER II

## CICADAS IN MYTHOLOGY, ART, AND LITERATURE

Selig bist du, liebe Kleine,  
Die du auf der Bäume Zweigen,  
Von geringem Trank begeistert,  
Singend wie ein König lebst!  
Dir gehöret eigen alles,  
Was du auf den Feldern siehest,  
Alles was die Stunden bringen:  
Lebest unter Ackersleuten,  
Ihre Freundin, unbeschädigt,  
Du, den Sterblichen Verehrte,  
Süssen Frühlings süsser Bote.  
Ja, dich lieben alle Musen,  
Phöbus selber muss dich lieben,  
Gaben dir die Silberstimme;  
Dich ergreift nie das Alter,  
Weise, zarte Dichterfreundin,  
Ohne Fleisch und Blut Geborne,  
Leidenlose Erdentochter,  
Fast den Göttern zu vergleichen.

GOETHE'S translation of *Anacreon*, Ode 43.

## CLASSICAL AND MEDIÆVAL WRITINGS OF THE WESTERN WORLD

"Ich habe viel darüber nachgedacht, woher es wohl gekommen sein mag, dass gerade die Cicaden unter allen Insekten am meisten beachtet worden sind; denn es ist eine Thatsache, dass keine Ordnung der Kerbtbiere sich einer solchen Berücksichtigung von Seiten der Alten zu erfreuen gehabt hat, wie die hier behandelten Sing-Zirpen." (MILDE, 1866, p. 18.)

PROBABLY the earliest reference to cicadas that has come down to us in any language dates from the tenth or eleventh century B.C., according to the epoch to which we assign Homer, and those portions of the *Iliad* more directly attributed to him. It is true that cicadas are considered, as we shall see later, in the ancient Chinese manual of *materia medica*, the *Pen Ts'ao*, and that the first edition of this book is popularly believed to have been issued by a semi-mythical emperor somewhere about 2000 B.C., but the first authentic publication was probably not earlier than 200 B.C., while the mention of cicadas apparently does not occur until the authoritative edition, the *Pen Ts'ao Kang Mu*, of A.D. 1578. However, in the Shang

Dynasty (1766–1122 B.C.), cicadas already figured constantly in Chinese decorative art. But the palm for antiquity must probably be conceded to certain fables and folk tales, the age of which undoubtedly immeasurably exceeds that of their recorded existence.

In the third book of the *Iliad* Homer compares the discourse of “sage chiefs exempt from war” to the song of cicadas, and he goes on to characterize it as “lily-like” (λειώεσσαν)—a comparison which has puzzled northern commentators not a little. Thus Leaf remarks:

“No satisfactory explanation has been given of the epithet ‘lily-like’ to a voice which has just been compared to that of a grasshopper, or rather cicada”;

and makes the suggestion that there may be a similarity in the creaking of loud-leaved plants like lilies when moved by the wind.\*

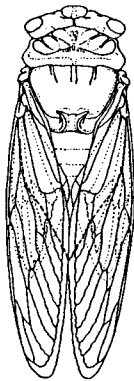


Fig. 1. The Cicada of the classics, *Tibicen plebeia* (Scop.).  
Female. N. E. Davenport del.

One sees such translations as “lily-like,” “light-winged,” “winged,” “smooth and clear,” “delicate,” while Chapman, in his well-known version, speaks of “cold spiny grasshoppers, though whispering,” and is evidently sure that the old men were in their dotage.

It is a fact that ever excites the wonder of the commentators, that most of the Greek classical references to cicada song are highly laudatory. Yet the Latin references, dealing apparently with the same species, characterize it as raucous and disagreeable. As it is hoped to show in a later section, the song of many species of Cicadae is nothing but pleasant to the modern musical ear, and doubtless such species exist among the smaller forms of Greece and of Italy, but there seems good reason to suppose that the one to which most of the classic passages refer was either *Tibicen plebeia* (fig. 1) or *Cicada orni*, or to both of these; and most recent observers seem to agree that these cicadas produce a strident and somewhat unpleasant noise; while there still remains the discrepancy between the Greek and Latin taste in this matter. Some writers have even gone so far as to use Greek praise of cicada song as a foundation for impugning Greek taste in music altogether (Rabaud, 1887). Thus McCoy (1880, p. 55) after describing the extremely loud notes of some of the larger Australian species, “which would tax the patience of a saint, if such existed in Australia,” mentions the surprising fact that the Greeks kept these insects in cages for the pleasure of hearing them sing and states:

“As the Chinese, however, do exactly the same still with their cicada, I fancy (as the *Cicadae* are too great conservatives to change) that the real fact may be that the ancient Greek taste for music may have resembled the execrable modern Chinese one, which, as I have heard it grandly exemplified in some of their theatres on the goldfields, might be said in its din to be diabolical—if the comparison were not perhaps unfair to the absent.”

The multifarious translations of the *Iliad* seldom employ the term “cicada” for τέρτιξ; “grasshopper” and “cricket” are much more frequently and very incorrectly substituted.

The dispute as to whether *Tibicen plebeia* or *Cicada orni* was the species commonly referred to by the Greeks, is probably to be settled by the consideration that both these species and also the other true Cicadidae were grouped under τέρτιξ. In fact, we know from the later work of Aristotle that this term included also leafhoppers, since the larger species (i.e. true cicadas) were distinguished as ἀχέται or chirpers and the smaller, often mute forms (i.e. leafhoppers) as τεττιγόνια.\*

It should be noted that some authors consider that the term ἀχέται was restricted to the males, i.e. to the actual singers (Schultz, 1897). Aristotle, as will be seen later, specifically introduces additional morphological (size) and phenological distinctions, and it would seem should therefore be credited in this matter with more taxonomic insight than the other views would imply. He certainly knew both sexes of his “chirpers” since he described copulation in some detail (see fuller discussion in Chapter IV).

The early epic period supplies other notices of cicadas, notably in the works of Hesiod. Thus, in *Works and Days*, the poet refers to

\* Groshans, G. P. F., *Prodromus Faunae Homeri et Hesiodi*. Lugduni Batavorum, Luchtman, 2 fascicles, 1839–1843; oct. 32+42 pp. *Tettix* fasc. prim., pp. 29–30.

\* W. Leaf, *A Companion to the Iliad*. London, 1892, p. 93. See also R. J. Cunliffe, *A Homeric Lexicon*. London, 1924, p. 379. George Chapman, *The Iliads of Homer*. . . . With introduction and notes by R. Hooper. London, 1865, 2nd ed., Vol. 1. W. Leaf, *The Iliad*. London, Vol. I.

the time "when the Skolymus flowers, and the tuneful Tettix sitting on a tree in the weary summer season pours forth from under his wings his shrill song . . ." (Buckton, 1890). The appearance of the cicada at the time when the artichoke flowers is noted by several later writers, notably by Pliny, who reads into it an occult significance, writing this under "Scolymus" (Lib. 22, cap. 2):

"*Venerem stimulare in vino, Hesiodo et Alcaeo testibus; qui florente ea cicadis accerimi cantus esse, et mulieres libidinis avidissimas, virosque in coitum pigerrimos scripsere, velut providentiu naturae hoc adiumento tunc valentissimo.*"

Swinton perhaps refers to the same plant when he writes nearly 3000 years later (1908, p. 382) than Hesiod:

"About the 9th of June, the small *Cicadatra atra* commenced to din incessantly on the tops of the purple globe thistles in the vineyards of Jerusalem."

Hesiod's reference to the source of the song "from under his wings" must interest us greatly as the first known reference to the method of sound-production in the Cicadidae. And this explanation, first put forward in the dateless ages of the past, is so far as it goes, correct—a truly surprising reflection in view of the multiplicity of fallacious hypotheses which have since, at one time or another, sought to implicate in stridulation almost every other organ of the cicada's body, from the rostrum to the ovipositor.

In the same writer's *Shield of Hercules* (lines 393-397) a passage begins:

"And when the dark-winged whirring grasshopper [τέτριξ, i.e. cicada] perched on a green shoot, begins to sing of summer to men—his food and drink is the dainty dew—and all day long from dawn pours forth his voice in the deadliest heat, when Sirius scorches the flesh . . ."\*

The cicada, disguised in our northern translations under various orthopteroid masks, figures later in the fables of Aesop, but these have so much in common with widespread folk-tales that they have been considered, with folk-lore, in another section.

Other references to these insects become very plentiful in later Greek literature. Perhaps the most famous single poem is the ode (43) long attributed to Anacreon, but probably of later origin (Buckton, 1890, Keller, 1913). Goethe's rather free translation heads this chapter. Many English versions have appeared, by Cowper and by many lesser poets, but none of the metrical attempts do justice to the original, save only Goethe's. The following prose

\* H. G. Evelyn-White, *The Homeric Hymns and Homerica: with an English translation*. London, 1914.

rendering based on the French of Amyot and Serville (1843, p. 478) is appended as a summary of Greek poetic thought concerning the cicada:

"We call you happy, O Cicada, because after you have drunk a little dew in the tree-tops you sing like a queen. All the good which you see in the fields and which the seasons produce in turn, are yours. You are the friend of the worker, to whom you do no wrong. You are worthy of the homage of mortals, you, the charming prophet of summer. The Muses love you. Phoebus himself loves you; he has given you your loud song. Old age reaches you not, O wise one, O daughter of the earth, O friend of music, O you who suffer no pain since you have neither flesh nor blood. You are truly like the Gods!"

Aristophanes mentions its time of appearance and describes its song in more than one passage. Thus in *The Birds* (Kennedy's trans. cited by McCoy, 1880, p. 56) he writes:

But in flowery meads I dwell,  
Lingering oft in leafy dell,  
When the inspired Cicada's gladness,  
Swelling into sunny madness,  
Filleth all the fervid noon  
With its shrill and ceaseless tune.

Alcaeus (Alkaios), a contemporary of Aristophanes, in an ode to summer (no. 39) makes due mention of the cicada so characteristic of that season.\*

Plato would leave no manner of doubt that he shared the general admiration for the cicada and its song. Thus in the opening portion of the *Phaedrus*,† the philosophers discover a rural retreat of a quiet beauty eliciting the remark:

"How delightful is the breeze:—so very sweet; and there is a sound in the air shrill and summerlike which makes answer to the chorus of the Cicadae."

Later an opportunity is taken to tell of the mystic origin of the cicadas, which, in an age before the Muses, were men.

"And when the Muses came and song appeared they were ravished with delight, and singing always, never thought of eating and drinking, until at last in their forgetfulness, they died. And now they live again in the grasshoppers; and *this* is the return which the Muses make to them—they neither hunger, nor thirst, but from the hour of their birth are always singing, and never eating or drinking;

\* H. W. Smith, *Greek Melic Poets*. London, 1900, p. 20.

† In note p. 221 the same writer cites as modern names for the cicada the onomatopoeic expressions ταιταϊακς and ταιταϊδα.

† Jowett's *Plato*, 3rd ed., 1892, Vol. I, p. 434.

and when they die they go and inform the Muses in heaven who honours them on earth. They win the love of Terpsichore for the dancers by their report on them ; of Erato for the lovers, and of the other Muses for those who do them honour, according to the several ways of honouring them ; of Calliope the eldest Muse and of Urania who is next to her, for the philosophers, of whose music the grasshoppers make report to them ; for these are the Muses who are chiefly concerned with heaven and thought, divine as well as human, and they have the sweetest utterance.”\*

In the mountains of Northern Italy there is a district known as La Romagna Toscana, where the inhabitants speak a rude form of the Bolognese dialect. According to Leland (1892, pp. 1-2) :

“ These Romagnoli are manifestly a very ancient race and appear to have preserved traditions and observances little changed from an incredibly early time.”

Leland appears to think it probable that they were not only pre-Roman, but also pre-Etrurian. Be this as it may, these peasants have preserved from remotest antiquity a story so similar to Plato's legend as to draw from Leland the remark quoted in a later page concerning the overwhelming probability of a common origin for such traditions. *La Cavalletta* (in this case almost certainly a cicada, though sometimes elsewhere a grasshopper) is the spirit of music and poetry. The Romagnolo version parallels Plato's very closely save that the cicada was once “ a lady full of talent good and beautiful,” instead of a man. Leland (*op. cit.*) has published the whole ballad in the Romagnolo dialect.

Theocritus states that the Greeks kept cicadas in cages and fed them with γήτειον (gethyum)—a kind of leek ! (Schultz, 1897, p. 421). Such a diet would lead one to suspect confusion with grasshoppers, insects which might conceivably eat leeks. The cicadas were kept thus chiefly for the sake of their song and the practice is current to-day, using grasshoppers and other Orthoptera, and to a less extent cicadas, in China and Japan (Hearn, 1900, Kershaw, 1903 *et al.*), and, it is said, in Spain (Milde, 1866, p. 42 ; Keller, 1913).

Landois suggests (1867, pp. 152-153) the insects were kept “ *um sich durch den monotonen Gesang in den Schlaf singen zu lassen.*” Landois never saw nor heard a live cicada.

Moufet, however, suggests another reason, in an obscure passage (1634, p. 127), which may be translated as follows :

“ . . . for it was not so much on account of the song that they cherished them along with the magpies and nightingales, but also

\* Jowett, *l.c.*, pp. 466-467. This story is so much misquoted that I have given a reputable translation *in extenso*. *Tettix* should, of course, be translated *cicada* and not *grasshopper*.

that they might observe the mutual advances, loves and passions of male and female,” or as Buckton puts it, “ watch their amatory ways.”

The couplet of Xenarchus, satirist of Rhodes, concerning the happy male cicadas blessed with irrevocably silent wives, has been quoted almost *ad nauseam*, and is mentioned here merely for the sake of completeness.

The saying of Dionysius, “ your cicadas shall chirp from the ground,” praised by Demetrius as a forcible way of voicing the threat, “ your trees shall be cut down,” bears witness to the arboreal habit of some of the species, in this case probably *orni*.\*

The Greek Anthology is replete with allusions to cicadas. Of these, the Euenus appeal to a bird which is carrying a cicada to its young, is quoted in our later chapter on the enemies of Cicadidae. Antipater of Thessalonica (Buckton, 1890) says that dew is enough to intoxicate cicadas. A poem of uncertain origin (Apollonides or Philippus) in the Wreath of Philippus, and probably dating from the first century A.D. may be translated :

“ The cicada used to sit on the highest boughs of the shrubs, and in the burning noontide sun, beating its belly with its wings, by the sweet variations of its self-wrought strains filled all the wilderness with music. But Criton of Pialia, the fowler who disdains no kind of game, caught this fleshless thing by its back with his limed twig,” and as a just punishment his daily craft now plays him false. He can catch nothing more.†

Archias has a beautiful poem concerning a cicada overcome by ants (Paton, *op. cit.*, Vol. II, pp. 120-121). This is quoted *in extenso* at the head of our section on insect enemies of cicadas.

Bianor gives us a variant of the Criton story (Paton, *op. cit.*, Vol. III, p. 147). In this case “ the never silent cicada was singing on the bushes, in the heat with its double-tongued mouth ” (διγλώσσῳ . . . στόματι). It is interesting to compare the two different conceptions as to the method of sound-production (see section on sound-organs).

Several poems are attributed to Meleager (first century B.C.). The following example indicates that some confusion existed in his mind between the true cicada and some member of the Orthoptera :

“ Noisy cicada, drunk with dew drops, . . . seated on the edge of the leaves, striking with saw-like legs thy sunburnt skin thou shrillest music like the lyre's. But sing, dear, some new tune to gladden the woodland nymphs, strike up some strain responsive to

\* W. R. Roberts, *Demetrius on Style. The Greek text of Demetrius de Elocutione*. Cambridge, 1902, p. 243.

† W. R. Paton, *The Greek Anthology, with an English Translation*. 5 vols London and New York, 1917, Vol. III, p. 141.

Pan's pipe, that I may escape from Love and snatch a little midday sleep . . ." (Paton, *op. cit.*, Vol. II, p. 111).

But on the same page Meleager says "Locust (*Ἀκρίς*), . . . beating with thy dear feet thy talking wings . . ."

Still in that miscellaneous collection, the *Anthologia Graeca*, we find a poem of uncertain origin voicing the protest of the cicada dragged by shepherds from "dewy boughs"\* (pp. 82-83).

This reminds us of the poem of Pamphilus (Grotius); "no longer do you sing, *blanda cicada, sed fugere aggressam pueri, vix puberis aevi, cantantem quamvis, te necuere manus.*"

Antipater of Byzantium (Burges, *op. cit.*, p. 103) addresses :

"Ye hanging branches of the wide-spreading oak . . . the dwelling of wood-doves, the dwelling of Tettiges, . . . defend me too, reclining under your leaves, and flying from the rays of the sun."

An unknown poet (Burges, *op. cit.*, p. 284) found a tettix lamenting as it struggled in the web of a spider, from the snares of which he freed it.

Leonidas of Tarentum (Burges, *op. cit.*, p. 458) :

"Not only on trees, warmed by summer heat, can I sing, but even upon the spear of Athene will you see me, the Tettix, seated."

Anye, or some say Leonidas, is credited with verse concerning Myro, both of whose pets died, and she "made a common tomb for the locust, the nightingale of the fields, and for the tettix, whose bed is in the oak, and both of whom Hades had taken away" (Burges, *op. cit.*, p. 295). Marcus Argentarius (i.e., p. 345) deals with the same theme.

Two much-quoted stories find apt treatment, if not their origin, in Strabo's *Geography* :

"The Halax River, which marks the boundary between the Rhegian and the Locrian territories, passes out through a deep ravine; and a peculiar thing happens there in connection with the grasshoppers [cicadas, tettiges], that although those on the Locrian bank sing, the others remain mute. As for the cause of this, it is conjectured that on the latter side the region is so densely shaded that the grasshoppers, being wet with dew, cannot expand their membranes, whereas those on the sunny side have dry and horn-like membranes and therefore can easily produce their song. And people used to show in Locri a statue of Eunomus, the cithara-bard, with a locust seated on the cithara. Timaeus says that Eunomus and Ariston of Rhegium were once contesting with each other at the Pythian games and fell to quarrelling about the casting of the lots; so Ariston begged the Delphians to co-operate with him, for the

\* G. Burges, *The Greek Anthology*. London, 1854, pp. viii + 519.

reason that his ancestors belonged to the god and that the colony had been sent forth from there; [footnote: from Delphi to Rhegium] and although Eunomus said that the Rhegini had absolutely no right even to participate in the vocal contests, since in their country even the grasshoppers [Cicadae], the sweetest-voiced of all creatures, were mute, Ariston was none the less held in favour and hoped for the victory; and yet Eunomus gained the victory and set up the afore-said image in his native land, because during the contest, when one of the chords broke, a grasshopper [Cicada] lit on his cithara and supplied the missing sound."\*

This is a story of the very greatest interest since in the light of recent knowledge of cicada behaviour there is every reason to suppose that it is based on fact. A perusal of our later chapter on behaviour will show that the instances of cicadas attracted by sharp sounds, such as would be produced by the twang of a breaking fiddle-string, are very numerous and concern many different cicada species.

The explanation that cicadas cannot sing unless their "membranes" are dry was repeated even as late as 1829 by Carus, who believed that the "air sac" said to communicate with the meta-thoracic spiracle (spiracle III) was a provision to that end (Milde, 1866).

Another hypothesis is more frequently adduced for the silence of Rhegian cicadas. We may quote the version of Solinus :

"*Cicadae apud Reginos mutae, nec usquam alibi : quod silentium miraculo est, nec inmerito, cum vicinae quae sunt Locrensium ultra ceteros sonent. Causas Granius tradit, cum obmurmurent illic Herculi quiescenti, deum iussisse ne streperent; itaque ex coeoptum silentium permanere.*"†

Thus wrote the Greek poets and historians of the favourite Tettix. It is not surprising that it found its way also into the designs of ancient coins and cut gems. Some of the most beautiful of such figures are illustrated by Imhoof-Blumer and Keller (1889, Taf. VII, 32-36; Taf. XXIII, 38; Taf. XXV, 18, 19).‡ One shows a fairly good representation of a cicada on a bronze coin from Athens; another—a drachme from Larisa in Thessaly indicates a horse licking its fore-foot, while a cicada lies above its back. A silver coin from Corinth bears the head of Athene with a cicada near the back of her helmet; while a piece from Astacus in Bithynia shows a hare

\* *The Geography of Strabo. With an English translation by H. L. Jones.* 8 vols. London and New York.

The Loeb Classical Library, 1924.

† *C. Iulii Solini Collectanea rerum memorabilium.* Th. Mommsen, Berlin, 1895, p. 41, lines 5-9.

‡ Figs. 43 and 44, Taf. XXIII, are labelled as cicadas but are decidedly nothing of the sort. 43 is perhaps a grasshopper.

running, and a cicada inscribed beneath it—a beautiful figure. But the most beautiful of all is a carnelian with the figure of a cicada showing all the details of the ventral surface. The rostrum, legs, opercula, and the segmentation of the abdomen are all faithfully portrayed. All these coins and gems date from classical antiquity.

King depicts an onyx signet, ornamented by a locust driving a plough drawn by a yoke of Cicadae.\* But in a lovely Pompeian mosaic the cart is placed before the horse, and a cicada acts as coachman on a wagon to which a parrot is harnessed (Keller, 1913).

Buckton (1891, Pl. H, figs. 8–10), besides copying many of the above-mentioned figures, illustrates also a beautiful cicada in chalcedony or onyx from Avezzano, Italy, of date about 300 B.C.

The children took special delight in the cicadas, as in many countries to-day. Thus in the graves of little ones among other loved playthings are often found brightly coloured figures of these insects. Keller (1913, fig. 125) illustrates one in clay from the British Museum from Tanagra. It is life-sized and very archaic. The venation of the wings is omitted, but the pronotum, cruciform elevation, abdominal segments and pygophor are distinct. The same writer instances an interesting gold cicada found in the cave of Pan on Parnassus (l.c., p. 607).

A coin from Caulonia (an ancient Greek colony in Italy, 500 B.C.) represents a naked male figure with a cicada and a stag. This may be Apollo, as Buckton would believe (1890). (Imhoof-Blumer and Keller, 1889, Taf. VII, fig. 33; copied also by Buckton.)

Similarly symbolic was the widespread occurrence of the tettix as a symbol of autochthony among the nobles of Athens. The cicada came from the tettigometra (τεττιγομήτρα) which visibly arose from the soil, undeniably “born of the earth.” The symbol took the concrete form of a golden brooch furnished with a spiral portion which served to hold together a braid or lock of hair. Scions of nobility, coiffured thus, were tettigophori (τεττιγοφόροι). A similar custom prevailed in Ionic Asia Minor.

But by drawing together the threads of Greek allusion in poetry and myth and by considering not infrequent explicit statements in this regard (cf. Buckton, 1890; Keller, 1913; Amyot, 1836; de Gubernatis, 1872), we find that the essential and primitive significance of the cicada in classic mythology was not as a symbol of ancient and noble birth, but as the beloved of the Muses and especially as the favourite of Apollo at once solar divinity and god of Music. In a very interesting passage this dedication to the sun god is traced by Keller (1913, p. 402) to an Eastern source. We translate the substance of his remarks as a base for a criticism of his hypothesis. He believes that the historic origin of the association was the

\* C. W. King and H. A. J. Munro, *A Horatii Flacii Opera illustrated from antique gems*. 80 illus. London, 1869, p. 452, fig. 333.

external element of sun blaze and summer heat ascribed by the Semites of Western Asia to the authorship of Baal or Beelzebub, and by the Greeks of the Asiatic border to that of Apollo Smintheus. Both gods ruled over noxious insects (vermin) and other summer plagues. The piercing rays of the sun seemed shafts which Baal-Apollo shot at mankind from his bow. This Baal was identical also with Baal-Melkarth, the Tyrian Hercules, the archer, who wandered over the earth with his bow. Thus the power of the Greek Hercules, in silencing forever with his curse, the cicadas of Rhegium which drove sleep from his weary brow, is ascribed to his essential identity with his Tyrian prototype and hence with Beelzebub—lord of vermin. But such an explanation, however plausible, ignores some of the essential characters of the myth which it seeks to explain. In the first place—given a sun god and given cicadas, the latter are so inherently and obviously creatures of the sun, singing almost only when it shines, and chirping with greater vehemence the fiercer its heat, that any association of cicadas and sun god is surely elementary and direct. In the second place, the “lord of vermin” hypothesis presupposes a conception in the Greek mind that cicadas were related to other insects and “vermin”; and not a single trace of such an idea has come down to us; but rather do all the references stress the mystery of its origin and of its relationships.

“Thou art truly like unto the Gods.” Here is no identification with vermin. It is true that Aristotle was far more cognizant of the place of cicadas in a natural system; but the thoughts of Aristotle do not belong to the realm of mythology. We have no indication at all that Greek myth distinguished even between cicadan and avian songsters any more than does the Maori folk-lore where the cicada figures as the “bird of Rehua.” And Rehua is the lord of kindness, of plenty; the season of plenty is summer with its sunshine—surely the likeness to Apollo is not distant. So much for the tettix, sacred to Apollo the sun god.

We believe that its association with the same deity in his capacity as patron of music was just as primitive and direct. There is firstly the no mean performance, certainly not inconspicuous, of the cicada musician itself; and there is secondly the attraction of cicadas to sudden and sometimes to musical sounds (e.g. bells); a fact well-authenticated by modern observation and suggesting that the Eunomus-Ariston myth may have been founded on an actual incident. On this basis what more natural than the positive attributes of the tettix in Greek myth—its song and its love of the sun? And what more natural than the appeal of such attributes to the open-air living, music-loving Greeks? Add to these qualities that of living only on dew; for the Greeks saw no signs that it ate any portion of the plant on which it lived; and characterize it also as “earth-born”—not “engendered of putrescence,” like flies, mice, and other vermin, but born of the clean, free earth of the fields,

as witness the rising of the tettigometra—and what can such a creature, in popular belief, have in common with noxious insects?

In his treatment of the cicada, as in larger matters, de Gubernatis carries the solar myth theory farther than most people care to follow him. He incorporates the belief, especially emphasized by Isidorus that froghoppers (Cercopidae: considered by the Greeks as small *tettiges* or *tettigoniae*) originated from the saliva of the cuckoo and generalizes as follows:

“The cicada is born again in spring of the cuckoo’s saliva, and in the morning of the dew of Aurora, . . . The cicada of summer appears, and the cuckoo of spring disappears; hence the popular belief that the cicadae wage war to the death with the cuckoo, attacking it under its wings; hence it is supposed that the cuckoo devours its own nurse; the aurora devours the night, . . .” (De Gubernatis, 1872, p. 224).

That there is some antagonism between cuckoos and cicadas in popular belief is indicated by the old Italian proverb, *Doue canta la Cigala, non canta il Cucco* (Aldrovandi, 1618).

We have surveyed but far from exhausted the allusions to cicadas in Greek mythopoetic fancy. There remains a by no means negligible literature which we may call scientific—a literature come down to us almost solely from Aristotle and his literary heirs and plagiarists. This may be briefly summarized here, but an evaluation of Aristotle’s contribution will be better attempted in connection with the various sections of cicada natural history dealt with by this father of the science. In his works, *De historia animalium*, *De partibus animalium* and *De generatione animalium*,\* Aristotle dealt first with the mouth-parts, feeding habits and classification of cicadas (Hist., lib. IV, cap. 7); then with the mode of sound production (*op. lib. cit.*, cap. 9); with generation of cicadas, which he contended is not spontaneous (*op. cit.*, lib. V., cap. 19); again with the classification, ethological distribution, copulation, general life-history, and use of food in a long chapter entitled, *De generibus cicadarum et eorum coitu* (*op. lib. cit.*, cap. 30, *vulgo*); and finally he considered respiration and once more feeding-habits (*Part.*, lib. II, cap. 16; lib. IV, cap. 5).

To sum up, Aristotle correctly described the mouth-parts as tubular and the feeding-process as sucking; he distinguished the larger singing cicadas from the smaller mute species (*tettigoniae*); he showed that cicadas arose only by the breeding of antecedent cicadas and not by spontaneous generation; noticed that the larger species were absent from treeless districts and observed what trees they loved best; detailed with some minuteness the process of copulation; described with surprising accuracy the deposition of

\* These works will be hereafter referred to by book and chapter number under the abbreviations, *Hist.*, *Part.* and *Gen.* respectively. Particulars of the editions consulted are given in the general bibliography.

the eggs in the stems of plants; noticed that the eggs produced small worms which entered the soil and grew into the final nymph or *tettigometra* and finally drew a graphic picture of the last ecdysis. All this stands to-day as sound. His restriction of cicada diet to dew, his reference to occasional oviposition in soil, and his naive account of respiration and sound-production—almost necessarily inaccurate with the means of research at his command—serve only to throw into greater relief the surprising justness of his other observations. Such was the treatise, copied by Pliny and by every mediæval writer on natural history, which was to serve as the substance and *ipse dixit* of Occidental tettigology for a period of exactly 2000 years, until the modern spirit in the scientific scepticism of Galileo and the anatomical acumen of Julius Casserius his contemporary burst upon the scene.

The contribution of the Roman genius to cicada literature was a characterization of the song as highly unpleasant; its addition to cicada science was nil.

We believe that no conclusive evidence has been brought forward to show that the Greek term, *tettix* (τέτιξ), has any other than an onomatopoeic origin. Its Latin equivalent, *cicada*, has almost certainly a similar derivation (Taschenberg, 1918). Buckton (1890) referred the question to Dr. Murray of Oxford Dictionary fame, and received the reply that the term *cicada* is at present an ultimate fact, but probably derived from one of the old Italian dialects from which Latin arose. We have seen how deeply rooted the cicada is in Greek mythology and we shall find it no less familiar in folk-lore and in the literature of the East. The cicada is one of the animals best known to man—a fact obscured by the comparatively recent northern drift of our own civilization to lands where cicadas hardly occur. And there is a very strong tendency for the names of familiar animals to be onomatopoeic. Thus, for example, are almost without exception the multifarious bird names of the Maori of New Zealand. The probable onomatopoeic nature of the word *Cicada* is obscured by the soft pronunciation of the initial *C*.

At least three other suggested derivations of the word are current. Of these the most frequent is that of Beckman, quoted by Westwood (1840), from *cicum* or *cicum*, a thin skin, and *ἀδῆω* to please, meaning a sound produced by a little skin. Others (Fletcher, 1883, p. 72; Blanchard, 1844; Swinton, 1880, p. 24) would substitute for the second term some form of *ἀείδω*, to sing. Such explanations demand in the popular mind, in remote antiquity, a conception of the method of sound-production which we are not justified in assuming. Moufet (1634) and many following him derive *cicada* from *citocudo*, in allusion to the short life of the adult—a hypothesis with every mark of artificiality. Finally we instance Amyot (1834, p. 66) among those who believe that the word *ciccus* is sometimes applied in Latin to a small grasshopper, and is related to a Greek term for



cock; cicada from the latter through the former as an onomatopoeic diminutive, in allusion to the noisy song. We believe that no more far-fetched theory has yet been proposed.

Virgil's estimation of the querulous and monotonous nature of Cicada song has been quoted as much as the couplet of Xenarchus. Thus, *et cantu querulae rumpent arbusta cicadae* (Georg., III, 1, 328); *sole sub ardenti resonant arbusta cicadis* (Eclog., II, 1, 13); while a reference to the feeding habits, as popularly conceived, is seen in *dumque thymo pascentur apes, dum rore cicadae* (Eclog., V, 1, 77). Buckton (1890) quotes and translates a reference with which I am not familiar in the original:

The creaking locusts with my voice conspire,  
They fried with heat, and I with fierce desire.

Both Buckton (1890) and Swinton (1880) refer to the story of Tithonus, the mortal beloved of Aurora and granted, at her request, the gift of immortality. In the excitement of the moment the plea for eternal youth was not included, nor was the full measure of the omission realized until Tithonus was sunk in toothless decrepitude and prayed then that he might die. But there could be no giving back the gift of the Gods, curse though it had now become, so Aurora changed him into an ever-complaining Cicada.

The rôle of cicadas in the system of omens receives mention by Plutarch in his *Life of Sylla*.\*

"This was the mythology of the wisest of the Tuscan sages, who were thought to possess a knowledge beyond other men. Whilst the Senate sat in consultation with the soothsayers, concerning these prodigies, in the temple of Bellona, a sparrow came flying in, before them all, with a grasshopper [cicada] in its mouth, and letting fall one part of it, flew away with the remainder. The diviners foreboded commotions and dissensions between the great landed proprietors and the common city populace; the latter, like the grasshopper, being loud and talkative; while the sparrow might represent the 'dwellers in the field.'"

Plutarch further lists, as a reason for considering the swallow odious and impious, that "she killeth and devoureth especially cicadas, which are sacred and musical" (Cowan, 1865).

Aelian mentions again the cicadas of the Rhegian and Locrian territories, and deals also with their general natural history, as likewise does Pliny, while Lucretius has two passages dealing with cicada metamorphosis. None of these accounts add substantially to Aristotle's treatise, but all of them will be considered later, in the chapters concerned.

A passage in Theocritus which we quote later when considering

\* Plutarch's *Lives of Illustrious Men*, corrected from the Greek and revised by A. H. Clough. Boston, 1881, p. 325.

cicada enemies, is the first hint we receive that Vespida occasionally attack cicadas.

Leaving the classics and proceeding to the mediæval writings, we may be permitted a detour through Egypt—a route not unlike that followed by learning itself. The consideration of Egypt in this section is the more justified from the fact that almost all we know of the cicada in the literature of the Nile has come down to us from a Greek source and seems hardly to have been confirmed by modern hieroglyphic study. Attention was first drawn to the matter by a sentence in Moufet (1634, p. 134):

"*Aegyptii per Cicadam pictam hominem mysticum et sacris initiatum notarunt. Novi Hieroglyphi eas nonnumquam musicos, nonnumquam garrulos significare frivole contendunt.*"

It would appear that at the beginning of the fifth century A.D., Horapollo, an Egyptian scribe, set to work to collate and perpetuate the remaining but fast-fading knowledge of the symbols on the monuments. This compilation was made "in the Egyptian language," and only a translation by Philip into Greek has come down to us. Philip apparently lived a century or two later than Horapollo. He added considerably of his own, both in matter and interpretation, especially in the second book, which contains the cicada references; so that, everything considered, the evidence of cicadas in Egyptian symbolism is not great, for an examination of recent works on the subject shows nothing to confirm it. *The Book of the Dead*, in which so many animals find mention, is silent concerning the insects of our study. The grasshopper, which might have been a mistranslation for cicada, is represented in the hieroglyphics by a sign so evidently Acridian as to dispel all doubts on this score.\*

So we give for what they are worth the references in Horapollo, and add those of Pierius Valerianus (Valeriano Bolzani, 1567) who was apparently one of the "novi Hieroglyphi" mentioned in the above citation from Moufet; but who based his remarks, at least where cicadas are concerned, on those of Horapollo. The latter writes:

"When they would symbolize a mystic man, and one initiated, they delineate a GRASSHOPPER; [in the original—τέττιγα] for he does not utter sounds through his mouth, but chirping by means of his spine, sings a sweet melody."†

\* Among several works examined, the chief were: E. A. Wallis Budge, *The Gods of the Egyptians or Studies in Egyptian Mythology*. 2 vols., illus. Chicago, 1904; and A. E. Knight, *An Account of the Gods, Amulets, and Scarabs of the Ancient Egyptians*. London, 80 illus., 1915.

† A. T. Cory, *The Hieroglyphics of Horapollo Nilous*. 120 illus. London, 1840, Book II, p. 119, No. 55.

Valerianus (1567) gives a crude figure entitled *vana garrulitas* showing a cicada perched on a stick; and another called *musica*—a cicada sitting on a stringed instrument, probably intended for the classic cithara. His treatise *De Cicada* (lib. 26, pp. 369–372 or leaves 192–193) is devoted only in small part to Egyptian references, of which latter the chief are as follows:

“*Putabant vero Aegyptii Cicadam, ut apud Horum legere est, per aculeum emodulari, quod motu suo stridorem ciceret veluti plectru quo citharae pulsantur*”;

and further:

“*Aegyptii sacerdotes hominem sacris initiatu, et mysticae discipline peritiam assecutum, per cicadam significabant, in eam scilicet admirationem adducti, quod animal tam exiguum, nullo oris comodo, non saucibus, non lingua predictum, tam argute caneret.*”

The most interesting Egyptian contribution is the theory that the song is produced by the rostrum which is compared to the bow of a stringed instrument. This rostrum, or spine (*aculeus*) was apparently (Felici, 1724) believed to rub on the under surface of the thorax, which thus formed a stridulating surface. This view of sound production is apparently peculiar to the Egyptians, and forms the strongest evidence that the Philip-Horapollo observations on cicadas in Egyptian symbolism are genuine. Aldrovandi (1618, p. 128) quotes from Lucian concerning the cicada: “*Ut apud Aegyptios erat nobilitatis signum.*”

Later references to cicadas lead us through the patristic and scholastic writings to the great compilation of Albertus Magnus, thence to the encyclopædists, Aldrovandi, Mufet, and their English and other translators, Johnston and later writers, and so to the beginnings of modern tettigology, ushered in by Galileo and Casserius, and established by Malpighi, Felici, and Réaumur.

Examples of the patristic references may be introduced by a consideration of a text in Jeremiah (viii. 7) which reads in the authorized edition, “and the turtle and the crane and the swallow observe the time of their coming; but my people know not the judgment of the Lord”; while the revised version has it, “the turtle-dove and the swallow and the crane observe the time of their coming.” Our present interest in this passage inheres in the fact that St. Chrysostom (*seq.* Aldrovandi, 1618, p. 127) translates instead of *crane, cicada*, and reads the passage thus: “*Turtur, et hirundo et cicada agri pasteres cognoverunt tempus adventum sui.*” Furthermore, he considers the turtle-dove to signify *omnem castam Ecclesiam*, the swallow, *vero Joannem hominum amatorem* and the cicada, *eloquentissimum Paulum Ecclesiae organum*, the latter comparison being especially delightful. But later commentators, though in

profound disagreement *inter se* on this passage, seem in no case to confirm Chrysostom's interpretation. Most editions of the Vulgate seem to translate the disputed term by some bird, and in none did I find *Cicada*. The two words usually rendered *swallow* and *crane* respectively are *sus*, or *sis* which, however, Luther translates *heron*, and *agur*, literally the chatterer. The correct order is that of the revised version, but there seems even some uncertainty whether the second term is not an adjective qualifying *sus*, rather than a substantive. The root of *agur* signifies a shrill penetrating sound, and is therefore not applicable to the deep trumpet note of the crane (*Grus*).\*

The emergent facts are these: the organism signified by *agur*, if this is used substantively, is noted for its shrill, piercing cry or chattering, and from the context it “comes” at a definite time. Most of the commentators seem to take it for granted that a chatterer must necessarily be a bird, while “coming” is to be interpreted in a purely territorial, rather than merely phenological manner. If an entomologist might rush in where exegetical angels fear to tread, he would suggest that Saint Chrysostom is probably correct, since both attributes would apply very well to the cicada.

Not only did the Fathers and the mediæval writers in most cases fail to extend Aristotle's observations; they fell often below the standard which he had set. In other words, Aristotle was an authority, and the appeal to authority was then notoriously universal, but *a priori* assumptions of theology constituted a greater authority and were sometimes opposed to Aristotle's conclusions. The benighted naturalist then sits on the fence with a leg dangling on each side. Thus Baldangelus believes it very doubtful that “*Cicadae omnes ex semine nascuntur, credit enim esse aliquas quae generantur ex putredine sponte*” (Aldrovandi, 1618). Similarly St. Basil the Great (Bishop of Cæsarea in Cappadocia, fourth century), while agreeing with Aristotle's description of sound production in the cicadas (Felici, 1724, p. 63) nevertheless proclaims:

“*Producat terra animam viventem. Hoc praeceptum terrae inhaesit, nec ea creatori desinit famulari. Alia enim ex successione eorum quae prius exstiteret, producuntur: alia vero ex ipsa terra etiam nunc adhuc vitam accipere compertum est. Non enim solum pluvio tempore edit cicadas, aut alia innumera volatilium in aere vagantium genera, quorum plurima propter tenuitatem sunt anonyma: sed mures etiam et ranas ex se ipsa profert.*”†

\* Among several works consulted, the most useful, and the source of the above information were: *Encyclopædia Biblica*, ed. Cheyne and Black, New York and London, 1899, Vol. I, column 973; and *Cyclopædia of Biblical, Theological and Ecclesiastical Literature*, J. McClintock and J. Strong, New York, 1881.

† In: Hexæmeron Homilia IX, Hom. IX. *Sancti Patris Nostri Basilii Cæsareæ Cappadociae Archiepiscopi Opera omnia quae exstant.* Paris, 6 vols., 1839, Tom. I, Pt. I, p. 115.

The remarks of Galen, of Dioscorides and of their Arabic commentators on the medicinal virtues of cicadas are considered in a later chapter.

We traverse a long period and come to the *De animalibus libri vigintisex* of the scholastic naturalist, Albertus Magnus, Bishop of Ratisbon (thirteenth century). His work, which is remarkable for containing the first indications of the experimental method, was not published until long after his death (the copy consulted was dated 1495).

His brief account of sound-production follows Aristotle, but he did prove at least that the head had nothing to do with it—*Experti sumus ego et socii mei quod capite amputato diu cantat in pectore sonans sicut fecit antea* (i.e., I have not reproduced the author's abbreviations). The small chapter of Albertus on Cicadas closes with a protest against applying the term to the large beetle which bears *cornua cervina*; *et hoc non bene quia scarabaeus est et non cicada* (i.e.). It is, however, by no means certain that Albertus himself has not confused the cicada with the cricket.

Our knowledge of mediæval zoology between Albertus Magnus and Gesner was rather a blank until 1914, when the discovery in the Vatican library of the *Animal Book* of Petrus Candidus helped to bridge the gap. According to Killermann this hitherto overlooked writer gives a very good figure of a cicada.\*

Eusebius of Nuremberg (1635), has much to say of Cicadas and especially of the relation between their time of appearance and the motions of the planets—*Motus caelestes in animalibus inveniuntur*. His treatment is essentially mediæval, and his version of the story of Francis of Assisi and the cicada may be quoted as characteristic. It occurs in chapter 95, under the charming title *miranda animalium obsequia* :

“Cum aliquando in horto inter fruteta deambulet [Franciscus Assisiensis] cicada ficulneam linquens, super evocantis manum cedit, et Deum laudare iussa, voce tinnula gutture fistulato suaviorem solito stridorem edidit. Humanum igitur consortium effugere solitae bestiolae Franciscum omnibus ex mansuetudine applaudentem creaturis adire non timuerunt, neque potuerunt non obtemperare imperante, cui iam divina inerat virtus.”

Petrus Bellonius (Pierre Belon) records (1555) a curious method of catching bee-eaters in Crete by means of hooks baited with cicadas. We quote his account in a later chapter.

Paracelsus apparently believed in spontaneous generation of cicadas from earth.

\* S. Killermann, Das Tierbuch des Petrus Candidus geschrieben, 1460, gemalt im 16 Jahrhundert (Codex Vaticanus Urb. lat. 276). Zoologische Annalen, Wurzburg, 6, pp. 113–221, 8 Taf. Cicada, pp. 129, 201.

“Alia est Cicadarum generatio, ut apud auctores legimus. Nam lutum si non debito tempore effodiatur, cicadas progignere testatur Paracelsus, atque ante eum Hesychius.” (Moufet, 1634, p. 132.)

A quaint discussion of cicadan feeding-habits by the Italian physician, Hierosme Cardanus (1584) is quoted in a later chapter.

We may fittingly conclude this section on mediæval literature by a brief description of the work of Aldrovandi and of Moufet, 1618 (first published 1602) and 1634 (posthumous) respectively. Both, but especially Aldrovandi's book, are colossal compilations—monuments of erudition; but both, in spite of their date of publication at least 120 years after the close of the mediæval period, are strictly scholastic in content and in outlook. The last and smallest reference in the classics is diligently sought out but Nature is not once interrogated. It might be said that Moufet, an Englishman, had little opportunity to see living cicadas and we know that the basis of his MS. came originally from Gesner; but the above remarks apply to his treatment of the commonest insects. Aldrovandi, who appears actually to have dissected these insects, shows six rather crude figures of cicadas, including one *non diu ex involucre egressa*, and one nymphal slough. Moufet gives more illustrations, one of which, obviously a *Platypleura* sp., is probably the cicada from Guinea, described in the text; while a second, *Tibicen* sp. (?) seems to be the insect brought from Virginia by one Candidus, *pictor non incelebris*.

One of Moufet's longest passages is devoted to moralizing comparisons between the habits of cicadas and those of man, greatly to the detriment of the latter. Thus :

“The Cicada, frugal in his meal, wants no variety in his meat, nor makes curious mixtures of abominations in his dishes. . . . These insects quench their thirst in dewy water whilst we the rather labour to excite it by alluring well-mixed cups.” (Buckton's trans., 1890.)

Moufet refers to more than fifty classical and mediæval authors who treat of Cicadidae while Aldrovandi quotes more still. The chapter of the latter *De Cicada* (lib. 2, cap. XIII) covers thirteen folio pages of small print, with numerous compact and strongly abbreviated references. The matter is dealt with under some thirty-one heads, of which we instance *victus, aetas, temperamentum, antipatheia, praesagia, mistica, moralia, symbolia, epitheta, apologi, aenigmata, emblemata*, and *epigrammata*. These two works must long remain the chief guide to classical references. But the eyes of both authors were fixed on the past and neither saw any sign of the new age of experiment which had dawned long before their books were published.

## CHAPTER III

CICADAS IN MYTHOLOGY, ART, AND  
LITERATURE (concluded)

" Si je rapporte de pareils faits ce n'est assurément, ni pour les faire croire, ni pour les combattre mais parce qu'ils nous montrent les progrès de l'esprit humain."

(RÉAUMUR, *The Natural History of Ants*,  
ed. by W. M. Wheeler, 1926, p. 45.)

## THE LITERATURE AND ART OF THE EAST

IN the East, as in the West, we find a classic golden age, a period of slavish adherence to classical authority and a renaissance of learning; only in the East the first term is incredibly remote and the middle period inordinately prolonged.

We have mentioned already the *Pen Ts'ao*—the great Chinese work on materia medica. The origin of this work is lost in the mists of antiquity, but the oldest editions now extant date from the fifth to sixth centuries A.D. The best-known and most authoritative edition was compiled from about a thousand previous works by *Li Shi Chen*, who began his work in 1552 and ended it in 1578.\* This version of fifty-two volumes is the *Pen Ts'ao Kang Mu*, which forms the basis of the Japanese translations and abridgments known as *Honzau Kaumoku*. Schumacher (1917a, fig. 6) copies a figure of *Huechys sanguinea*, the red medicinal cicada, from one of the latter published in 1847. A discussion of the rôle of this cicada in Chinese medicine will be found in the appropriate section. In the *Pen Ts'ao Kang Mu*, this cicada is known as *Chu-ki*, or *Ailanthus* cicada, from its predilection for the tree, *Ailanthus foetida*. It is known also (F. Porter Smith, 1871) as *Hung-liang-tsze* or "red lady-bug," and as "the fowl of the *Ailanthus* tree," from the noise which it emits. The latter name reminds one of Amyot's derivation of the word *cicada*, from the Greek term for a cock.

Von Murr (1775) mentions a figure of a cicada in an old "Naturgeschichte von Sina." Amyot (1836), who by the way was responsible for introducing several Chinese words as generic terms

\* E. Bretschneider, *Botanicon Sinicum*. Notes on Chinese Botany from native and western sources. *Journ. N. China Br. Roy. Asiat. Soc.* (1881). Shanghai, 1882, n.s., 16, Pt. 1, pp. 18-230. See also Schumacher, 1917a, pp. 368-382.

in cicada taxonomy (*Huechys*, etc.), saw in "la grande Encyclopédie chinoise," printed in Japan in the early years of the eighteenth century, several wood engravings of cicadas and a nymph. The cicada itself was labelled *Tchen*, while the nymph—the *tettigometra* or cicada mother, of the Greeks—was *Tchen touy*, i.e. the cicada with a skin which falls like that of a serpent. Rabaud (1887, p. 206) states:

" Les habitants du Céleste-Empire étaient littéralement fanatiques de notre chanteur, ils le mettaient partout, son image recouvrant les meubles, on le dessinait sur les vêtements et l'on ne faisait point de visite sans porter avec soi un certain nombre des ces animaux. L'empereur enfin, avait créé la charge de grand cigaliste. Le haut fonctionnaire honoré de ce titre devait fournir chaque année une quantité déterminée de cigales vivantes à l'empereur qui adorait son doux criquettement."

According to Lafcadio Hearn (1900) a celebrated Chinese scholar known in Japanese literature as *Riku-Un*, wrote about the five virtues of the cicada in a manner highly reminiscent of Anacreon's famous ode 43. Among its attributes there were listed, for example:

It eats nothing belonging to earth and drinks only dew, proving cleanliness, purity and propriety; it will not accept wheat or rice, thus indicating its probity and honesty; and finally—how appealing to celestial conservatives!—it appears always at a fixed time, showing it is endowed with fidelity, sincerity and truthfulness.

Its appearance at the summer solstice was used as a definite date in the Calendar (according to a little calendar of Hsia).\* Not only does the cicada serve as the harbinger of summer, but sets in motion the *yen* principle, the approach of which is heralded by its song. The Chinese were attracted and mystified by its curious life-history. The larva was said to bury itself in the ground for four years. "After boring its way up it emerged in the pupa state into the sunshine, where it burst its case and developed into the full-grown insect" (Pope-Hennessy, *op. cit.*). During adult life it ate the wind and drank the dew.

Gradually the cicada became associated with the ideas of death and of a future life. The Emperor Hang Ts'ung (A.D. 735) regarded the insect as a symbol of the passage from mortal life to a higher state. Kin Yuan (314 B.C.) wrote, "He divested himself of his body as the cicada divests itself of the impure and the abject."†

In Taoism the cicada became the natural symbol of the *hsien*, or soul, disengaging itself from the body at death. Disembodied *hsien*

\* Pope-Hennessy, Dame Una, 1923, *Early Chinese Jades*. London, pp. 124-126.

† Quoted by Dame U. Pope-Hennessy (*op. cit.*), from Wieger.

might appear to mortals in the guise of a cicada. According to Taoist rules, it was customary to make use of the image of a cicada in preparing a corpse for burial. It seems to be a debated question among the archæologists whether it was already in the Chou Dynasty (1122–255 B.C.) or not until the Han (206 B.C. to A.D. 220) that the custom arose of placing a jade cicada in the mouth of the dead, in order magically to aid the *hsien* or immortal soul to disengage itself from the body. The cicada tongue amulets figure very largely in the ancient Chinese texts. Laufer\* believes that as personal amulets worn by the corpse are imitative of bodily forms, those for the tongue of the corpse were primarily modelled on that organ, and only secondarily came to be carved in the exact semblance of cicadas, while still preserving the general shape of a tongue. The evidence is obscure on this point, for even the so-called plain tongue-shaped amulets usually show some cicada characteristics, and have obviously been made with the insect in mind.†

Several of the jade ornaments figured by Pelliot‡, and identified by him as cicadas, are highly conventionalized, but numerous others are beautiful and life-like. Thus Plate XXXIX of this work is devoted wholly to "cigales," including several "chrysalides de cigale." Of the latter, figures 7, 9, and 10 are undoubtedly nymphs, showing in side view not at all conventionalized and with very life-like fossorial fore-legs. But others of the "chrysalides" appear to be adults with the wings closely folded or omitted. The heads are shown in fine detail. The ten cicadas on this plate date from the early Han period—206 B.C. to 24 B.C. Plate XV presents, among other objects, a cicada in jade (Han Dynasty), about five cm. long, easily recognized but somewhat conventional. Plate XL, figures 3, 7, and 10, are cicada nymphs of the later Han period—25 B.C. to A.D. 220.

But these famous tongue amulets by no means represent the only cicada-motif in Chinese art, nor the earliest. In her interesting work already quoted, Dame Una Pope-Hennessy describes cicadas as constantly used in the decoration of Shang bronzes (1766–1122 B.C.) and mentions a recognizable cicada carved on a bone sceptre in the British Museum, reputed to be of the same Dynasty. Laufer figures some Han jade buckles representing a mantis catching a cicada—a design believed by some authorities to be emblematic of destiny.

The rôle of the cicada in Chinese mythology was apparently not always beneficent, for cicadas in human disguise were, according to

\* Laufer, B. 1912. *Jade. A Study in Chinese Archæology and Religion*. Field Mus., Chicago, Publ. 154, Anthropol. Ser., Vol. 10, pp. xiv + 370, 68 pls. (6 col.) and 204 figs.

† Cf. Laufer, *op. cit.*, Pl. XXXVI, figs. 1–4.

‡ Paul Pelliot, *Jades Archaiques de Chine appartenant à C.T. Loo et Cie*. Libr. Nat. d'Art et Hist.; Paris, pp. 35, Pls. I–XLVI, 1925.

de Groot,\* "no less prone than sundry mammals and reptiles to seduce women." There is a legend of a lover, shot at by a spying husband, turning into a cicada and flying away.

Before leaving the Chinese mainland we figure (fig. 2) a cicada carved in amber and used as a button in Korea. It is of unknown but probable not very ancient date, and was collected by Mrs. E. H. Wilson.

In Japan cicadas are known as *Sémi* (Hearn, l.c., Kaempfer), *semmi*, or *sebi* (Cowan, von Murr, Kaempfer), *zemi* (Matsumura). Hearn has quoted a selection of the countless Japanese poems concerning these insects, which are, however, less appreciated for their music than are various Orthoptera, though Cockerell (1925) appears to indicate that they are among the singing insects caught and caged

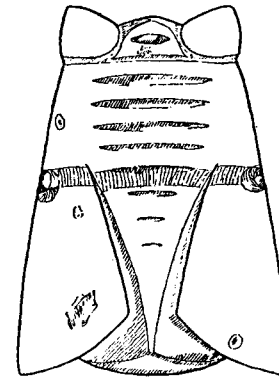


Fig. 2. An amber button from Korea in shape of a Cicada.  
M. Percy del.

in Japan. The poems on Cicadas are usually brief, taking the form of *hokku* or compositions of seventeen syllables. Hearn quotes no fewer than thirty-eight, and for these we must refer to his charming essay. Some—a few—are in praise of the song, but more are the reverse; while others indicate that the natural history of the cicada has furnished Buddhism with parables for the teaching of doctrine. We give examples of all:

Soko no nai  
Atsusa ya kumo ni  
Sémi no koë.

SAREN.

Fathomless deepens the heat; the ceaseless shrilling of Sémi  
Mounts, like a hissing of fire, up to the motionless clouds.

\* de Groot, J. J. M. 1892–1910. *The Religious System of China*. Leyden, Vol. V, Bk. II, Pt. II, Demonology, Ch. I, sect. 10. "Insects as Demons," p. 649.

Kagéroishi  
Kumo mata satté  
Sémi no koe.  
Kito.

Gone, the shadowing clouds!—again, the shrilling of sémi  
Rises and slowly swells,—ever increasing the heat.

Sémi hitotsu  
Matsu no yū-hi wo  
Kakaé—keri.

Poet unknown.

Lo! on the topmost pine, a solitary cicada  
Vainly attempts to clasp one last red beam of sun.

Man sheds his body only as the sémi shed its skin. The exuviae  
are the symbols of earthly pomp.

Yo no naka yo  
Kaëru no hadaka,  
Sémi no kinu!

Naked as frogs and weak we enter this life of trouble;  
Shedding our pomp we pass; so sémi quit their skins.

Hearn's essay is illustrated with figures from a book in the Imperial Library, called *Pictures and Descriptions of Insects*—a naïve work attributed to an unknown writer in 1856.

The Boston Museum of Fine Arts possesses two beautiful Japanese medicine boxes (*Inrō*) of recent date, ornamented with cicada figures. The one is in gold relief while the other is a painting on lacquer, representing, without any doubt, *Graptosaltria colorata* (Stål), the strikingly marked *Aburazemi*, or oil cicada of the Japanese, so named because its song sounds like the frying of fat on a hot fire. We figure a very beautiful third example from the Victoria and Albert Museum. In this, which is of carved wood, the *inrō* represents an adult cicada, and the *netsuké* or toggle shows the abandoned nymphal case.

In the same museum are two *netsuki's* in carved wood, representing cicadas with folded wings, in rich detail. The British Museum has two beautiful Japanese ivory carvings of the type known as *Okimono*, both representing cicadas with great fidelity. One is an adult insect, while the other is a nymph, perfect even to the spines on the powerful fossorial front legs.

In India the cicada receives curious mention in that ancient code of Hindu laws known as *Manava-Dharma-Sastra* or the Institutes of Manu, which originated at an unknown but very early period, but date in their present form from somewhere between 200 B.C. and A.D. 200 (Buhler). Translating from Deslongchamps's French version we read:

“Learn now, completely and in order, for what deeds committed here below, the soul must, in this world, enter into such or such a

body . . . to achieve the expiation of its sins. If it has stolen meat it must enter the body of a vulture; . . . if salt, that of a cicada.”\*

I have seen no explanation of this curious belief.

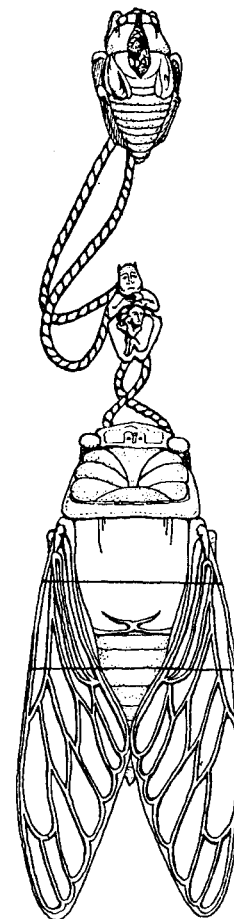


Fig. 3. A Japanese *inrō* or medicine-case carved in wood, from a specimen in the Victoria and Albert Museum. N. E. Davenport del.

\* A. L. Deslongchamps, *Manava-Dharma-Sastra. Lois de Manou*. Paris, 2 vols., 8°, 1830-1833, Vol. II, p. 449 (*Manu* Livr. XII, 53, 63).

## FOLK-LORE AND MYTHOLOGY

Much of a strictly mythological nature has already been studied in the preceding sections. Under the present heading we group the beliefs and mythopoetic fancies of more primitive people and such as have not found expression in the greater literatures of the world.

That the very oldest instances of men's interest in cicadas are probably to be found in the long unwritten folk-lore and fables of simple people has been already suggested. When we find practically the same fable, replete with the same details, occurring in such widely separated places as Europe and New Zealand, in the fables of the ancient Greek and in the folk-lore of the nineteenth-century Maori, we must either recognize an extremely high antiquity or subscribe to Jung's doctrine of

"myths and symbols, which can arise autochthonously in every corner of the earth and are none the less identical, just because they are fashioned out of the same world-wide human unconscious, whose contents are infinitely less variable than are races and individuals."\*

The opposite view is well stated by Leland (1892, p. 181) in the following words :

"Of those who attribute all of these identities in tradition to *chance* coincidences and 'development under like causes,' one can only say, as did the old orthodox Christian of the doctrine of atoms, and fortuitous combinations, that it put upon the back of chance more than it could bear."

We shall return to this question when the fable referred to has been quoted. That most noted of all fabulists, Æsop the Phrygian slave, is said to have lived about 620 to 560 B.C., but even granting the authenticity of these dates, there remains no certainty that even those fables more definitely ascribed to his authorship, were purely the product of his imagination rather than the literary expression of already long-current folk-tales. Their content bears all the evidence of the latter origin. One of the best known of Æsop's fables is that of the Cicada and the Ant ; but it is less generally noticed that at least two others in which cicadas figure are included in his work. The first of the latter concerns an ass which envied greatly the cicadas' musical talent, and with rather vulgar estimate of the origin of genius, enquired on what food they lived to give them such beautiful voices. They replied, "Dew." In following this alimentary regime the ass died. In the second fable an owl was kept from its midday sleep by the ceaseless song of a neighbouring cicada. Entreaties and threats availing nothing to stem the flood

\* C. G. Jung, *Psychological Types*. New York, Harcourt, Brace & Co. 1924, p. 152.

of melody, the owl turned to cajolery, and more to the point offered a drink—some nectar given by Pallas herself. Such a respite from the monotony of plain dew was too tempting to refuse: the guest arrived at the bar, was snapped up and killed.

The story of the Ant and the Cicada, the solidly industrious and provident ant and the shiftless singer, cursed with an excess of the artistic temperament and forced to beg for food when the chills of autumn had put a stop to carolling in the sun, is surely known to almost every child of our Western civilization. Æsop unquestionably indicated a true cicada (τέττις), but La Fontaine's version, which is the form best known in northern lands, substitutes the great green grasshopper (*Locusta viridissima* L.) which is known as "la Cigale" in those parts of France where the true cicadas are not common and where La Fontaine lived. In some English versions even the cricket, more familiar than either cicada or grasshopper, is made to play the part of the suppliant. Samaniego, the Spanish fabulist (1745-1801) was more fortunate. He at least had no lack of cicadas around him. Yet in a school reading-book in Cuba the fable of "La Cigarra y la Hormiga" was illustrated by a cut of a large Acridid grasshopper. Whether the fault was Samaniego's or only the artist's I do not know.

But the substitution of a more familiar insect for the cicada in regions where the latter does not occur is less a literary error than a process of legitimate mythological metamorphosis. On the same principle the serpent of an age-old phallic myth becomes, among the Maori of New Zealand, where snakes do not occur, a *tuna*, or common fresh-water eel.

This much is assured; if Æsop's is the original version of the fable, then the original actor was a true cicada. But Fabre (1921, p. 217) believes, "La légende de la Cigale, si mal accueillie de la Fourmi, est vieille comme l'égoïsme, c'est-à-dire comme le monde."

In this we would agree with the great French entomologist, but we follow him less easily when he would derive the Greek version from "quelque légende venue de l'Inde, la vénérable mère des civilisations," a legend in which the suppliant singer was not a cicada but "bien quelque autre animal, un insecte si l'on veut, dont les mœurs concordaient convenablement avec le texte adopté."

All the evidence seems to point to a very high antiquity for the fable and to the identification of one of the principal actors with a true cicada. In support of both these theses is to be adduced the presence of this fable in the oral traditions of the Maori of New Zealand (Best, 1909, p. 240; 1924, pp. 217, 219). Among the Maori of the still primitive Urewera forests the cicada are known as *Kikihi*, *Kihikihī*, or *Kikihitara*.

"They are an exceedingly numerous people. During the *waru patote* (eighth month of the Maori year) these people cling to their



*Cystosoma saundersi* Westw. From Australia. Male  
Enlarged

R. Stenton, photo

[face p. 29



ancestor *Tane-mahuta* [settle on trees] and sing lustily. Here is the song of these people :

"In summer I cling to my ancestor, Tane-mahuta. Ever I sing, as Makaro rises I sing. Who fears the long nights? 'Twas Tane who nourished me. When comes the ninth month then I descend to his home, I and my young relative Nuhe (Anuhe), he who was sent down to prey on his elder Rongo, and ever does so."\*

But the Popokorua, or ant, sang another and quieter song, as he worked at the base of the tree.

"Haste, O friend, and delay not. How excellent are the ways of the ant, how needless for man to direct him to form a hole as a shelter from rain and the cold that pierces nightly, the collecting of seeds as sustenance for the inner man, that he may survive."\*

And the ant adjured the cicada :

"Let us . . . collect much food during the warm season, even that we may retain life when the cold of Takarua comes." But Kikihi, the Cicada, replied : "Nay, let us rather bask on the sun-warmed bark . . . and sing a merry lilt : " and he sang, "What is my pleasure? It is idling and clinging to tree branches, basking in sunshine and just clapping my wings."†

"When in after days, the warmth went out of the sun, when Hine Takurua, the Winter Maid, abode with the Earth Mother, when Tioroa hardened the waters, and Macke chilled the earth, then it was that Kikihi, the Cicada, perished of cold and hunger. But the Ant, how snug is he in his sheltered home, well stocked with much food ! "

We should finally note that no harvesting ants are known from New Zealand. The probability is that the Maori brought with them this fable, in essentially its present form, from the Orient (i.e. N.W. from New Zealand), long before their entrance into Polynesia. This would agree with Fabre's view of an Indian origin for the fable, since there is some slight evidence (Best, 1924, p. 21) that the ancestors of the Maori people were in India itself at one period of their wanderings, and departed thence before the Buddhist era. But such common origin for Æsop's version and the Maori form would not

\* I owe to Mr. Elsdon Best, the foremost student of Maori lore, the translations of the songs and the information that *Anuhe* is the caterpillar of *Sphinx convolvuli*, which was sent down from heaven to assail *Rongo*, which represents the *Kumara*, or sweet potato.

† This "wing clapping" undoubtedly refers to the vigorous clicking produced by the wings as an accompaniment to the song, in the tree-dwelling species; and is not to be taken as evidence that the Maori believed the actual song to be produced thus. The species concerned is quite evidently *Melampsalta cingulata*.

support Fabre's further opinion that the original actor was some other insect than a true cicada. Of interest in this connection would be a thorough search in Oriental folk-lore. The only Indian reference known to me is one in the Laws of Manu, quoted previously, and a brief note by Biscoe (1896) that the Gonds believe the cicadas die, "because from making so much noise their heads drop off."

Taylor (1870, p. 643) gives *Tarakihiki* as the common Maori term for the cicada, which is, he says, regarded as the harbinger of summer. ;

"The Maori compare the sound of the song to the English language, hence they call it *he reo kiki kiki*, the cicada's language, and thus they name the European, *he kihikihi*, a cicada."

A noisy party is compared proverbially with cicadas in summer—*ne he kiki kei te waru*.

*Kihikihi* I found to be the common term for *cicada* in the far north of New Zealand, at Parenga-renga, where it was applied by the children indiscriminately both to the large, black, tree-dwelling *Melampsalta cingulata* and the small, bright green *M. muta* var. *culora*.

Andersen (1923b, pp. 765-767) in one of his charming studies of New Zealand bird song, dealt with a few cicada songs, justifying their inclusion in the following terms :

"Whilst this is not a bird, it has a song, and the song was liked by the Maori above all others; indeed he called the cicada, 'the bird of Rehua.' Rehua was the lord of kindness, and the reason the Maori held the insect in such estimation was that its cheerful song sounded in the summer when the days were warm and long and food was plentiful. Then the Maori, happy himself, enjoyed the shrill song of the merry cicada."

He even based a very popular *haka* or war song on the notes of one of the larger species (Andersen, 1923a).

In Australia, a land of large and abundant cicadas, the aborigines, according to Bennett (1834, pp. 236-237) are quite familiar with the fact that only the males sing.

"My notice was particularly directed by the natives to the drums in the male insects, as the means by which they produced their thrilling sounds; at the same time adding [*sic*], in their peculiar English, 'Old woman *Galang, galang* no got; no make a noise'; implying that the females do not possess these musical instruments."

"*Galang, galang*," let it be noted, is the native name for cicada.

Still in the Pacific, but far north in Micronesia, we find in the Caroline Islands (teste F. W. Christian, 1899, p. 361) that in one of the dialects the term for cicada is "tenter," which is applied secondarily to any "noisy, blustering person, to chattering busybodies,

and carriers of tales and idle gossip." "Tenterong" is "to chatter." The Paniauan chant in the metre of the Kalevala,

*T'ititik melakaka-n-tenter*

*nin chounopong chenchereti* is translated, "Shrills the chirp of the Cicala thrilling through the moonlight."

On the island of Yap in the same group the cicada is called *Rui*, which recalls the Malayan, *Riang-riang* (Christian); but in this connection Moulton (1911, p. 144) states that the usual Malay name is *bringin*.

Beccari (1904, p. 11), writing of the great Bornean cicada, *Pomponia imperatoria*, states that the Malays call it *Kriang pokul anam* or 6 o'clock cicada, because of the regularity of its song in the evening. Moulton (l.c.) considers that this name is Sarawak-Malay only.

In the Malay Peninsula the Malays say "the *riang-riang* sing because their livers are glad" (Annandale, 1900), which recalls irresistibly the punning answer to the question, "Is life worth living?"

The Karens of Burma regard one species as the herald of the dry season (Mason, 1860). In Japan, on the other hand, one late species, *Meimuna opalifera*, is the forerunner of winter (Matsumura, 1898).

In South China the common species receives the name *Hi-chee-sim*, i.e. Li-chee insect, because it appears when Li-chee fruit is in season (Kershaw, 1903).

On the Shantung Peninsula "the natives are persuaded that the 'autumn coolers' . . . as they call them, live on nothing else but wind and dew" (Fauvel, 1876, p. 13). Here surely is a striking parallel with Greek views on feeding-habits.

*Huechys sanguinea*, used as a vesicant in China, is called, from its loud note, and from its favourite tree, "the little cock of the *Ailanthus* tree" (*Ailanthus foetida*) (F. Porter Smith, 1871, p. 689).

The Japanese call one large species *Kuma Sebi*. This is wingless and is said to pass the winter underground, emerging in spring, when another "fly" breaks out of its back, but this second fly returns to the earth when the dog-days are over. The old traveller Kaempfer (1724, *Liv. I*, p. 114) who collected this information was not convinced as to the return.

*Meimuna opalifera*, the *Tsuku-tsuku-boshi*, has a note resembling that of a songbird. This cicada is really the mournful spirit of a man from Tsukushi (ancient name for Kyūshū) who fell sick and died far away from home, his ghost becoming this autumn cicada, which cries incessantly "*Tsukushi-koishi!*" (I long for Tsukushi) (Hearn, 1900).

Throughout most of Europe the term for cicada is commonly some philological variant of this name, e.g. *cicala*, *cigale*, *cigarra*, *chicharra*, *cicada*, *cicóra*, *Zikade*; but sometimes characteristic local names are encountered. Thus in the vineyards near Würzburg,

*Tibicina haematodes* is the "Lauer," while in those of the neighbourhood of Tübingen the name is "Rebmann" (Leydig, 1902, p. 112; Vogel, 1923).

Among English-speaking peoples the general term is *cicada* among the better informed and *locust* with the masses. How the latter confusion arose is difficult to imagine. It was corrected as early as 1688 by Mentzel. Classical scholars have usually correctly used "locust" for the Greek *ἀκρίς*. The usage would therefore seem to have originated elsewhere, and perhaps in the early days of American colonization, when the innumerable swarms of emerging seventeen-year cicadas (*Magicicada septendecim*) simulated at least in their multitude the locusts of the Scriptural narratives.

Jaeger (1854) went further and naively decided that it was incorrect to call the Scriptural plagues "locusts" as they were rather grasshoppers than true locusts in the American sense, i.e. cicadas. Potter (1839) seems to have been the first to suggest this etymological transmogrification. He would clear up all confusion by restricting the term "locusts" to Cicadidae, and retaining the name "cicadae" for biblical "locusts" and other Orthoptera!

The parallel with the plagues of Egypt was completed by the devastated appearance of the trees consequent on excessive oviposition, and by the consumption of the insect as food by Indians and by various domestic animals. Be this as it may, *locust* is the commonest appellation for the cicada in the United States, and is prevalent also in New Zealand and in Australia; though in the former Dominion "singer" is also widespread, while Australia is notable for the wide variety of popular names for individual species—names picturesque and autochthonous, albeit Caucasian—such as "Floury Miller," "Green Monday," "Washerwoman." In South Africa cicadas are often known as "Christmas bees," probably in allusion to their appearance in summer.

In some parts of France cicada song predicts good weather (Valmont-Bomare); and the same belief is general in New England (Bergen, 1899, p. 45). Less comprehensible is the central Vermont tradition that cicada shrilling signifies rain (Bergen, l.c.).

De Gubernatis gives a Tuscan proverb among thieves:

*Quando la cicala il c. batte  
La' ha de m. chi non si fa la parte.*

(He is a fool who cannot make his own fortune during the harvest.)

Another Italian saying, *Cigale schioppate*, quoted by Aldrovandi in his industrious compilation (1618, p. 131), recalls the belief in the Crimea (Gadd, 1908, p. 144) that the nymphal exuviae seen clinging to the tree-trunks and branches have been burst by singing. Peasants of the Southern Tyrol say that the cicada "singe sich die Seele aus dem Leibe" (Milde, 1866, p. 15).

Marian (1903, pp. 456-458) gives an interesting account of

Roumanian folk-lore connected with cicadas, of which two species are determined as *Cicada orni* and *C. montana* respectively, though it seems almost certain from internal evidence that the last-named is really referable to *Tibicina haematodes*. *Orni* is characterized as liking especially the ash, the bark of which it pierces to suck the sap. The peasants of the Megleria district, however, say that it lives not only on ash, but also on other trees, and sucks the sap until it bursts—a conception greatly at variance with that of the classics, which gave to the cicada (probably to *Tibicen plebeia*) a very abstemious disposition. We shall see later that there is a very great difference between cicada species in respect to feeding-habits, and that *plebeia* is observed to feed much less frequently than *orni*.

In a part of Macedonia (Marian, l.c.) when the peasants capture a cicada they bury it in the field, believing that disinterment after a sufficient lapse of time will produce money in its place.

The belief is widespread in Macedonia that cicadas bring luck—a function in folk-lore more commonly attributed to large green grasshoppers, as for instance in the mountains of Northern Italy (Leland, 1892) and in Cuba.

In Roumania *orni* is known as *Cicóra*, *Cicórea*, *Grierete de tómnă*, *Țicóri*, *Țărtarcă*, and in Macedonia as *Dindir*, *Dzindzir*, *Đinđinar*, and *Chincălă*—the last obviously related to Latin *cicada* (compare Ital. *cicala*, Span. *chicharra*).

The vineyard cicada—*Greurușul viilor*—is identified by Marian as *Montana*, but is almost certainly *Tibicina haematodes*. It is phenologically very intimately associated with the vine industry. Thus its first song is the sign for the *luminéză strugură* or grape harvest, about the sixth of August. From that date it is said to sing until holy Friday (*la Vineria mare*), the fourteenth of October.

In France according to Fabre (ed. 1921), the Provençal peasant still retains his faith in the diuretic properties of cicadas taken internally. The same author (l.c.) prints a ballad in the Provençal dialect, but apparently of recent origin.

In the Bermudas a cicada, *Tibicen bermudiana* (Verrill), soon forced itself on the notice of the colonists, and received in the early seventeenth century the following mention from Governor Butler (Lefroy, 1882, p. 6):

“Wormes in the earth, and mould also, ther are but too many . . ., as likewise the grass-hopper, and a certaine sommer-singing great flie, the sure token of the established springe (and in that respect as the English nightingale and cukoe), whose loud note very much resemblinge the whirle of a spindle, hath caused herselfe thereby to be called the good-huswife.”

But there is no law of priority in popular nomenclature, and the present Bermudans have changed the name to “scissors-grinder.” (Verrill, 1902, p. 324).

The famous seventeen-year cicada of North America qualified abundantly as a folk-lore character, and there could be no other interpretation of the dark W-mark on both tegmina than the portent of war (Bergen, l.c., p. 41). Such a belief, trivial as it is, yet supplies interest as a genuine item of white American folk-lore, of which American plant and animal names afford other quaint and often beautiful examples.

Among the American Indians the pueblo-dwellers furnish the greatest story-tellers. Thus the Zuni Indians preserve a charming folk-tale to explain the dental characteristics of that over-worked actor in Amerindian animal mythology, the coyote. A cicada sitting on a piñon branch and singing after the fashion of his race, “*tchumali, tchumali, shohkoya, tchumali, tchumali*,” excited the fervent admiration of a coyote, who asked that he might be taught the song and allowed to carry it home to his family. He was not an apt pupil, but in the end, and after a fashion, the tune was learned. But on the homeward journey the coyote, meditating his new accomplishment, stumbled in a gopher’s hole and what with the shock of the fall, and the irritation of the dust in his eyes and nostrils, every detail of the tune was driven from his head. To cut a long story short, twice an accident occurred and twice the coyote returned to his teacher perched upon the piñon bough. But the second time the “locust,” somewhat distrustful, had resolved to take no more risks, but rather to teach the coyote a lesson of another kind. Gripping strongly the bark and bracing himself firmly he swelled and strained until his back split open and he was able to divest himself completely of his old skin, which still, however, retained its shape and position. Choosing a suitable quartz pebble he then slipped this into the sloughed skin, sealed the vent with pitch and flew to a neighbouring tree. But there on the piñon branch he left his exact image—an image, however, which gave back no answer to the requests of the returning coyote. All too soon the patience of the latter was exhausted: with a spring he seized the counterfeit cicada, crushed the skin and splintered his teeth on the stone inside—crushed and broke the teeth in the middle of his jaw, driving some of them so far down into his gums that one could barely see them, and crowding out the others so that they were regular tusks. This is seen in every coyote’s mouth at the present day.

“In the days of the ancients the Coyote minded not his own business and restrained not his anger. So he bit a Locust that was only the skin of one with a stone inside. And all his descendants have inherited his broken teeth. And so also to this day, when Locusts venture out on a sunny morning to sing a song, it is not infrequently their custom to protect themselves from the consequences of attracting too much attention by skinning themselves and leaving their counterparts on the trees” (Cushing, 1901).

In Cuba it is popularly believed that the *chicharras*, after living luxuriously on foliage for a time, sing and then swell up and burst. The latter operation is performed by all the cicadas in the vicinity in unison as though at a given signal.\* In this form the belief is rather puzzling. Possibly the order of events has become transposed; for the "living luxuriously" may refer to the nymphal feeding, and the "bursting" to the final ecdysis, which in many species does occur, very spectacularly, in concert.

In Surinam (Guiana) Madame Merian, the famous naturalist-traveller of the early eighteenth century, painted and studied cicadas and other insects and brought back to Europe a graphic account of the luminescent head of the great lantern-fly, now placed in the genus *Laternaria*. Plate 49 (Tome I) of her great work (referred to in the Latin and French edition of 1771) presents a strange mixture of fact and fancy, of accurate observation and somewhat surprising credulity. The figures of the cicadas and lantern-flies are excellent, but the lower portion of the picture contains a composite formed of the head of a *Laternaria* grafted on the body and appendages of a cicada. The facts are these: Madame Merian discovered cicada nymphs—"une espèce d'Escarbots"—and was particularly impressed by their "*longue trompe*" which she assumed was used to suck honey from flowers. She found also the cicadas, which emerge from the nymphs, and were given the name of "*Lierman*" by the Dutch on account of their song. She noticed further that the *Escarbot*, the *Lierman*, and the *Lantarendrager* or lantern-fly were all furnished with a similar "*longue trompe—qu'ils ne perdent point dans toutes leurs transformations.*" Yet more, she observed that the first gave rise to the second, and so, when "*les Indiens*" informed her that the second metamorphosed into the third, that the cicada was "*la mère des Portes-Lanternes*" just as the nymph was "*la mère des ces mouches*" [Cicadas] she believed them and expressed her belief in the composite figure, of which she writes:

"La mouche que j'ai dessinée en bas sur une fleur de Grenade représente un Vielleur, qui peu à-peu prend la forme d'un Porte-Lanterne."

Yet she actually claimed to have seen such a composite:

"Je conserve une de ces mouches qui est prête à se transformer, elle a conservé toute la forme d'une mouche, n'ayant pas même changé ses ailes, mais cette vessie, dont j'ai parlé [the prolongation of the lantern-fly head], lui a crue à la tête; . . ."

The confusion between the lantern-fly and one of the large cicadas, probably a *Fidicina* sp., would seem to be widespread

\* I am indebted for this interesting note to Mr. R. M. Grey, Superintendent of the Harvard Botanical Garden, Soledad, Cuba.

among the Guiana natives. Not only is the cicada believed to metamorphose into the other insect, but it is credited also with a similar song, an accomplishment for which there is as much evidence as for the metamorphosis.

Before closing the chapter on folk-lore we are tempted to review the notes of a European writer (J. Dyer Ball, 1904) on China, who describes the female cicadas as eating voraciously of green leaves and then laying on the branches their eggs, whence the newly-hatched young bore into the substance of the tree until they reach the ground; for this is the difference between the bad science of an ignorant writer and the folk-tales of a nature-loving people—the former lacks those touches of verisimilitude which give to the latter so much of their charm.

The literature and folk-lore of most of the larger regions of the world contain some references to Cicadidae. Almost the only exception concerns Africa apart from Egypt, and the hiatus is probably greater in my knowledge of Ethiopian folk-lore than in the folk tales themselves.

The historical development of popular belief, mediæval theory and semi-scientific hypothesis concerning the method of sound-production, the alleged medicinal value, the feeding-habits of cicadas and the formation of manna by their agency, is considered at the heads of the various chapters concerned.

#### MODERN LITERATURE

To draw a hard-and-fast line between mediæval and modern literature is of course impossible in a chronological sense. The terms should perhaps be discarded here as carrying too strong a chronological implication. In fact it is not rare for popular writings to exhibit pre-Aristotelian conceptions at the present day. But the dawn of modern tettiology dates from Julius Casserius and Galileo at the beginning of the seventeenth century. It is true that the culminating efforts of the encyclopædists were published after this date, but most of the separate memoirs on cicada biology produced thereafter, and beginning with that of Casserius are strictly experimental in outlook. Such purely scientific contributions are amenable to bibliographic treatment in the appropriate later chapters, and need occupy us no longer here.

Modern literary references to cicadas are of course largely classical and traditional rather than naturalistic in inspiration. Our northern poets have not usually had the opportunity for direct contact, save perhaps in Italy, where they have usually subscribed to the Latin estimate of cicada "music" as harsh, monotonous, and generally disagreeable.

The very name was unfamiliar in Northern Europe, so that in "*A New Complete and Universal Body or System of Natural History*,

. . . Written by a Society of Gentlemen . . . and Published under the Immediate Inspection of George Henry Miller, Esq." (London, date unknown), we meet the naïve suggestion that this technical term, *cicada*, be changed to the good English expression "Cricket Dragon Fly."

Goethe (Taschenberg, 1916, 1917; Franz, 1917), rather unexpectedly in a figure almost as great in science as in poetry, would seem to have confused cicadas and grasshoppers. Thus in *Faust (Prolog im Himmel)*, mankind is compared to

eine der langbeinigen Zikaden  
Die immer fliegt und fliegend springt,  
Und gleich im Gras ihr altes Liedchen singt.

Conversely, in *Italienischer Reise* (Franz, 1917) the same writer undoubtedly describes cicadas and their song under the term "Heuschrecken."

Browning (*de Gustibus*) knew true cicadas :

Or look for me, old fellow of mine . . .  
In a sea-side house to the farther South,  
Where the baked cicalas die of drouth,  
And one sharp tree—'tis a cypress—stands,  
By the many hundred years red-rusted . . .

Tennyson writes :

The grasshopper is silent in the grass,  
The lizard with his shadow on the stone  
Rests like a shadow, and the cicala sleeps.

*Ænone.*

At eve a dry cicala sung,—  
There came a sound as of the sea.

*Mariana in the South.*

Byron evidently refers to *Cicada orni*, which he had good opportunity to know :

The shrill cicalas, people of the pine,  
Making their summer lives one ceaseless song,  
Were the sole echoes save my steed's and mine,  
And Vesper bells that rose the boughs along : . . .

*Don Juan, Canto III, stanza 106.*

Anatole France has the following passage, among others, in the true classical tradition :

*Hermodorus* : It is true, Zenothemis, that the soul is nourished on ecstasy, as the cicada is nourished on dew.

*Thais, English translation.*

Cicadas and their song find frequent mention in the writings of Pierre Loti, while Paul Arène has been called "Le poète des Cigales."

There are charming poems devoted to cicadas by Jean Amade and Just Calveyrach—Catalan poets both.

. . . Toi qui sais jouir d'un destin si court,  
Oui, je te bénis pour ton âme fière  
Et pour ton amour  
De notre lumière.

JEAN AMADE.

Observations of more scientific interest were made by many of the old voyagers of the eighteenth and nineteenth centuries, who saw cicadas in various parts of the world, wrote of them as strange and unfamiliar insects and named them "A Kind of Locust" (Dampier) or "great scorpion-flies" (Captain Cook).

A similar break in traditional knowledge of cicadas occurred when the lands discovered by these explorers were settled by pioneers and emigrants who named these insects *de novo*, often, as in Australia, in rich and expressive idiom. Thus the Australian *Macrotristria angularis* is known (teste Mr. H. Ashburner) as the "Whisky Drinker." Its protuberant face is bulbous and bright red.