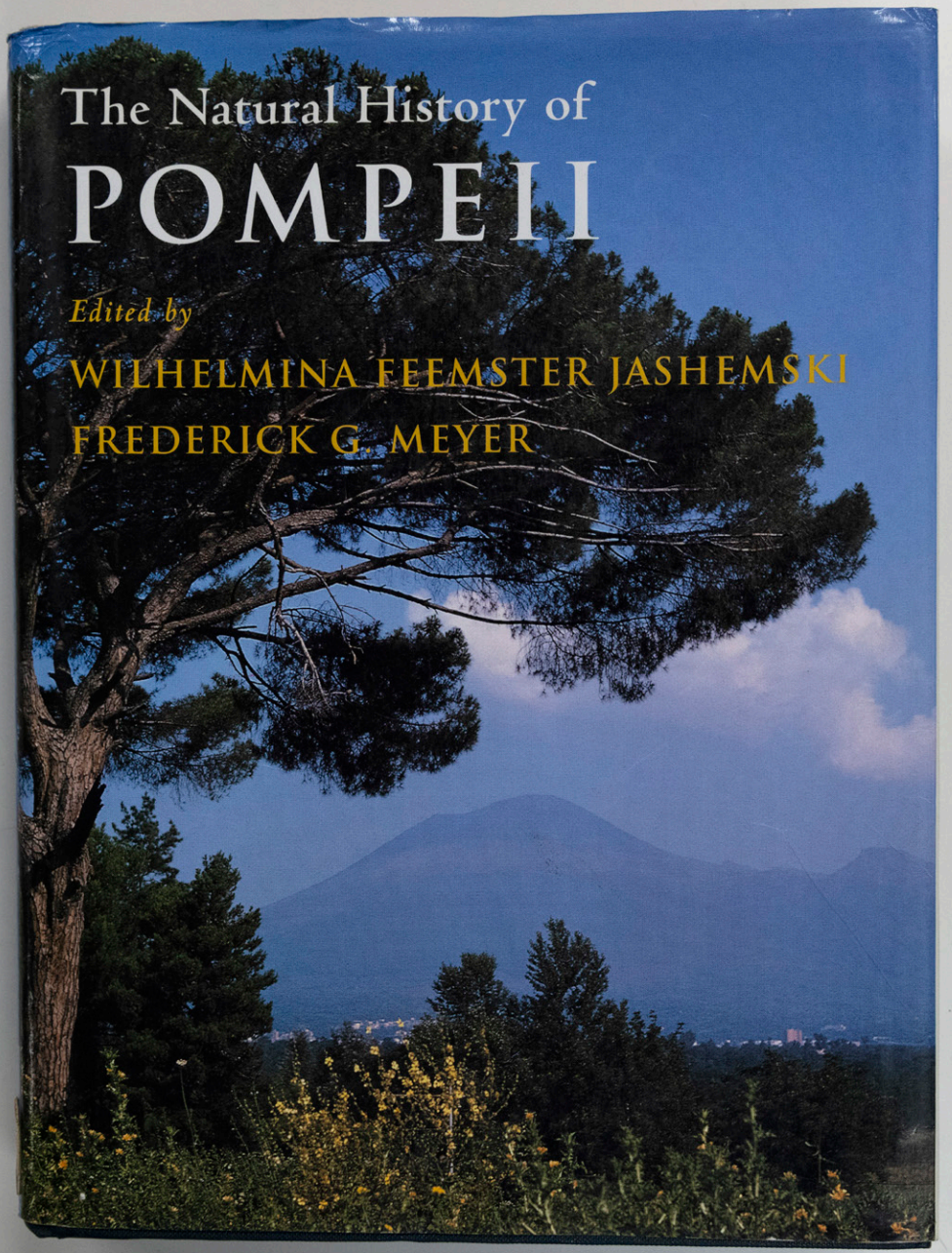
The Natural History of
POMPEII
Edited by
WILHELMINA FEEMSTER JASHEMSKI
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FIGURE 1 Pine tree (*Pinus pinea*) and wild flowers grow at Pompei in the shadow of Vesuvius.

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WILHELMINA FEEMSTER JASHEMSKI

University of Maryland

FREDERICK G. MEYER

U.S. National Arboretum, Washington, D.C.

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14

INSECTS

EVIDENCE FROM WALL PAINTINGS, SCULPTURE, MOSAICS, CARBONIZED REMAINS, AND ANCIENT AUTHORS

Hiram G. Larew

> But we marvel at elephants' shoulders carrying castles, and bulls' necks and the fierce tossing of their heads, at the rapacity of tigers and the manes of lions, where as really Nature is to be found in her entirety nowhere more than in her smallest creations.
>
> Pliny *HN* 11.4

Insects, through recorded history, have captured the eye, imagination, and respect of naturalists. The size of these "smallest creations," we have learned, belies their importance. If the study of insects is fascinating (and it is), the study of how our understanding of insects developed is equally intriguing. The history of entomology has been studied for many years (Howard 1930; Smith, Mittler, and Smith 1973) and provides general insights into how humans relate to their surroundings. For example, many insects and most of their body parts are barely visible to the unaided eye. Entomological depictions and accounts made before the advent of magnifying lenses demonstrate the power and flaw of human perception and interpretive skills.

Pompeii and Herculaneum offer unique windows to the ancient western world. For historians of biology, study of these preserved sites coupled with encyclopedic accounts of natural history left by ancient authors such as Pliny, Cato, Varro, and Columella permit verification and fuller understanding of the sites and the accounts. Preserved remains and unearthed depictions bring life to the written testaments of ancient Roman natural history.

The potential of Pompeii and Herculaneum, however, as sites for entomological remains is largely unexplored. The few biological remains and depictions that have been uncovered add depth to written accounts, but even more, they highlight the need for entomosensitive excavations and interpretive studies. By comparing written accounts of the time with the limited amount of physical evidence, this chapter will demonstrate what is known and, in so doing, will attempt to tantalize with suggested potential.

DEPICTIONS

The mosaics, wall paintings, sculpture, and other preserved decorative depictions of insects known from Pompeii, Herculaneum, and the villas destroyed by Vesuvius are important because they indicate how people of the time viewed insects. Unfortunately, the number of known depictions of insects is small, particularly so when compared to avifaunal and botanical artwork. Animals depicted in Pompeii, including insects, were inventoried by Matteucig (*animali*). Of the 218 animal species listed, only 9 (4 percent) were insects. As one might expect, the most decorative of insects, the butterflies, were indeed depicted. But apparently birds and plants were considered more familiar and more indicative of outdoor scenery – perhaps more tranquil and bucolic subjects for illustration in living quarters – than were insects. If art was allegorical, then perhaps the scarcity of known insect illustrations implies that insects bore fewer symbolic traits than other animals. When they *were* used as artwork subjects, insects were often viewed by the artist as an element in the web of life, another indication of nature's bounty. They were not the featured centerpiece but a significant part of interdependent "biovariety." The possibility exists, of course, that depictions of insects are scarce because they simply have been overlooked by modern investiga-

tors, and that rescrutinization of known mosaics, murals, and sculpture will reveal entomological finds.

PRESERVED REMAINS

Unlike depictions, preserved remains confirm the presence of specific types of insects and, depending on the situation in which they are found, may suggest how humans of the time interacted with (e.g., used, controlled, enjoyed) insects. But even rarer than depictions is the extent to which insects were preserved in the eruption. Available evidence is covered in this chapter, and its paucity suggests that a finer-tooth comb, patience, and a keenly trained eye are required to uncover and recognize remains.

ANCIENT LITERATURE

Entomological literature was surprisingly rich at the time of the Vesuvian eruption. Davies and Kathirithamby (1986) provide description of the fairly extensive entomological knowledge in ancient Greece. In their review of the literature, both Bodenheimer (1928) and Morge (1973) indicate that while misconceptions occurred, a rudimentary but often correct understanding of the behavior of some insects was apparent – this in a time when deductive research was unknown and an unaided, lensless mode of observation was, most likely, the natural historian's primary method.

If the length of account and depth of understanding reflects amount of interest, then, much as today, insects took literary third seat to vertebrates and plants. All of the ancients spend much more time discussing crops and cattle than they do insects. As will be seen, however, insects that were important to humans, either as friend or foe, received their fair share of attention.

In three works (*History of Animals, On the Parts of the Animals,* and *On the Generation of Animals*) Aristotle (384–322 B.C.) established a framework for insect classification based on wings and mouthparts. He also described for the first time the notion of developmental stages (i.e., egg, larva or nymph, pupa or chrysalis, and adult), and of molting, reproduction, and the production of sound. He discussed sericulture (silk production) and apiculture (raising honeybees) in detail. Moths, butterflies, house flies, mosquitoes, cicadas, lice, gall wasps, locusts, grasshoppers, bees, and wasps are all discussed by him (see Bodenheimer 1928; Morge 1973; Davies and Kathirithamby 1986). Most important, Aristotle, using an entomological example, took a significant scientific step forward by arguing that the understanding of bee reproduction was best based upon observation, not hearsay or theory. Although many of his observations are now recognized as inaccurate (for example, like many other ancients, he believed the queen bee was actually a king), he is nonetheless credited with a bold break from his predecessors – trusting his eye.

Aristotle's student, Theophrastus, in his *Enquiry into Plants,* concentrated on botanical descriptions but often included information on insects that injured or were merely associated with plants. He knew flea beetles, wood-boring insects, and pests of beans, grapes, apples, pears, olives, and medicinal plants. He mentioned galls (1.2.1) in passing as a "peculiar part" of an oak. His discussion of apiculture built on that of Aristotle.

Cato and Varro included information on pests in their practical manuals on husbandry and farming that was based on firsthand experience. Columella included practical measures for pest control in his *De re rustica.*

Insects were discussed as sources of medicinal remedies by Dioscorides. In the *Materia Medica* we know that bed bugs, cockroaches, soldier beetles, and scale insects were part of the recognized insect inventory. He also provided a detailed discussion (1.146) of the medicinal uses of insect-caused plant galls from oaks, which he called *omphacitis.*

In Pliny's work *Natural History* (*HN*), we have a large compilation of all that was known at the time of the eruption. Viewed from a modern perspective we see that Pliny owed a tremendous debt to earlier Greek entomological writings, but his contributions to entomology as a compiler are solid. References to insects are found throughout Pliny's treatise. The first half of Book 11 is devoted to a discussion of insects, including their ability to breathe, their body fluids, their lack of bones and skin, the independence of each limb, and special features of their eyes and senses. It also includes accounts of particular types of insects. Insects, spiders, millipedes, and honey are all mentioned as ingredients in various medicines in *HN* Book 30.

Important references are also found in poetry. Vergil's *Georgics,* a poem devoted entirely to agriculture, has much to say about bees in Book 4. He describes hives made of bark, or woven osier (willow twigs), discusses the "king" of the hive and his activities, and is entranced by the hive's "life under majesty of law."

INSECTS OF POMPEII AND VICINITY

The following discussion covers references in ancient literature as well as known depictions and preserved remains of insects from Pompeii and the surrounding area. Coverage is by insect Orders listed alphabetically, including Coleoptera, Diptera, Hymenoptera, Lepidoptera, and Orthoptera. Spiders and their close relatives, although not insects, are briefly discussed.

1. ORDER COLEOPTERA

English, beetles; Italian, *scarafaggio, maglio*

> . . . in some species the wings are protected by an outer covering of shell, for instance beetles.
> Pliny *HN* 11.97

EVIDENCE FROM ANCIENT AUTHORS

Several kinds of beetles (*scarabaei*) are discussed by the ancient writers. Death watch beetles, dung beetles, stag beetles, glowworms, woodworms, fireflies, and fig beetles are each mentioned briefly by Pliny throughout Book 11. He describes medicinal uses of buprestids in Book 30. The agricultural writers such as Columella, Cato, and Varro describe damage caused by grain weevils, flea beetles, and buprestids. Columella (*RR* 1.6.10–7) goes into considerable detail about construction of aboveground grain stores so as to prevent or discourage attack by weevils (*curculiones*). As pointed out by Morge, these recommendations are noteworthy in their timelessness and accuracy. For example, below-ground storage as described by Cato (*RR* 92) and Pliny (*HN* 18.301–8) accurately depicts methods used in parts of the world today. Cato (*RR* 92) also discussed a mixture of "slime" made of olive pressings that could be used to line granaries to suppress beetle attack. Varro (*RR* 1.57) describes the use of ashes as a protectant in stored grains – again, a method still used in many countries today. All in all, the detail of the ancients' recommendations regarding beetle pests twenty centuries ago is strikingly familiar today.

CARBONIZED MATERIAL

A specimen of a lathridiid scavenger beetle, *Microgramme ruficollis* Marshen was identified by J. Kingsolver (Research Entomologist, U.S. Department of Agriculture, Smithsonian Institution, Washington, D.C.) in carbonized hay in the *villa rustica* at Oplontis (Fig. 256). The beautifully preserved hind section of another beetle (tentatively identified as a weevil in the genus *Otiorhynchus*) was also found in the hay (Fig. 257). Parts of bruchid weevils have been extracted from boreholes in preserved beans found in the garden of the House of the Ship *Europa* (1.xv) at Pompeii (Fig. 258). This last specimen leaves no doubt that storage pests were encountered in Campanian gardens. The lesson in these discoveries is that all preserved plant materials should be carefully examined for insect remains or damage.

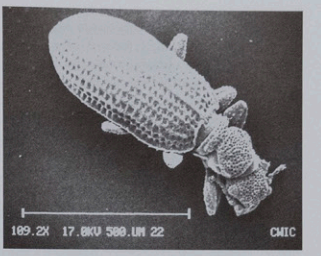


FIGURE 256 Carbonized scavenger beetle, *Microgramme ruficollis,* from hay, *villa rustica,* Oplontis. Photo: F. Heuber.

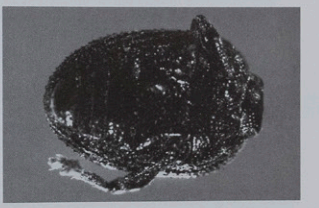
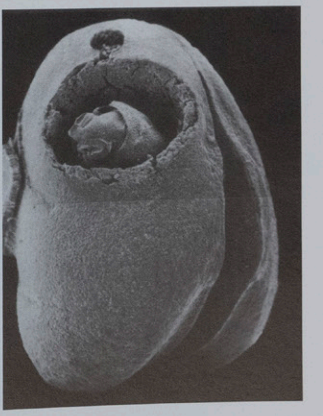


FIGURE 257 Hind quarters of a carbonized beetle, from hay, *villa rustica,* Oplontis; tentatively identified as an *Otiorhynchus* species.

FIGURE 258 Bean with bruchid beetle in hole. Photo: USDA.



SCULPTURE

Most of the known depictions that are suggestive of beetles are found in the marble frieze of Eumachia. One such rendering shows a lizard or salamander feeding on a relatively large insect (*Melolontha melolontha* according to Matteucig 1974b, no. 5 in his checklist; a June beetle in the family Scarabaeidae) (see Fig. 282). The insect has the overall round head and tapered shape of a fly. The size of the insect, however, relative to the lizard, and its prominent and flatly folded wings that resemble elytra (thickened fore wings) suggest a beetle. Much as the bird/grasshopper predation seen in other parts of the frieze, this depiction indicates an understanding of food webs. Matteucig (1974b) identifies two other animals as beetles in the frieze (nos. 38 and 39 in his list) but does not comment on them. A beetlelike figure is sculpted on the sides of a bronze mantic hand used in the worship of Sabazius (Jashemski 1979: fig 137).

REMARKS

The existence of beetles as specimens from the ruins of Pompeii indicates, as we would expect, that they were present. However, the specimens and depictions do not yet match written accounts for insight into the ancients' understanding of beetles. Additional specimens and less stylized renderings are required.

2. ORDER DIPTERA

English, fly; Italian, *mosca*
English, mosquito; Italian, *zanzara*
English, gnat; Italian, *moscerino*

> We shall get rid of the flies which infest wounds by pouring on them pitch and oil or fat.
>
> Columella, *RR* 6.33.1

EVIDENCE FROM ANCIENT AUTHORS

The ancient authors make numerous references to various kinds of flies (*muscae*), including house flies, horse flies, carrion flies, blow flies, gnats, and mosquitoes (*culices*). Columella, as quoted here, describes remedies for livestock flies. Pliny (*HN* 11.120) says that horse flies (*tabani*) die of blindness and that if flies are killed by dampness, they can be resuscitated by being buried in ashes.

SCULPTURE

Matteucig (1974b) lists three flies as being represented in the Eumachia marble frieze (nos. 19, 79, 88 in his checklist). One (Fig. 259) shows a small insect (a muscoid brachyocerid fly according to Matteucig) that has a small head and wings that are flat with nonoverlapping rounded tips – traits that are suggestive of a stationary fly crawling up the frieze. He also lists one of the carved flies as a dung fly, *Cypselus apus* (*animali*), but this identification is problematic given the imprecision of the carving.

3. ORDER HYMENOPTERA

English, bee; Italian, *ape*
English, wasp; Italian, *vespa*
English, hornet; Italian, *calabrone*
English, ant; Italian, *formica*

> . . . but among all of these species the chief place belongs to the bees, and this rightly is the species chiefly admired, because they alone of this genus have been created for the sake of man.
>
> Pliny *HN* 11.11

EVIDENCE FROM ANCIENT AUTHORS

Honeybees (*apes*) were the most discussed, observed, respected, and admired insects in antiquity. According

FIGURE 259 Flylike insect and grasshopper, Eumachia. Photo: F. Meyer.

to Varro (*RR* 3.16.), mead was a common beverage, and honey an item of commerce. Beekeeping was described in detail, and not surprisingly, swarms were sold by keepers. In fact, Varro warns buyers to check swarms to make sure the bees are healthy. General instructions for building and siting apiaries (hives) was provided by Varro (*RR* 3.16.15–6), and he mentions at least three kinds of construction materials, namely round hives of twigs, pieces of hollow trees, or earthenware.

Pliny devotes more descriptive detail to bees by far than to any other insect. His wonderment in them is reflected in phrases such as, "they have a system of manners that outstrips that of all the other animals," and "nature is so mighty a power that out of what is almost a tiny ghost of an animal she has created something incomparable" (*HN* 11.12). The initial cause for excitement was undoubtedly honey, but from the lengthy description of hive lifestyle given by most writers of the time it seems clear that colony behavior became a metaphor for human society and thus intrigued the writers. And the level of understanding was remarkable; significant misinterpretations were self-assuredly presented as facts (as they are today), but in large part hive life was understood for the microcosm that it is. For example, Pliny discusses hibernation, hive construction, nectar collection, hive organization, division of labor, honey flavor as determined by flowers visited, smoking as a hive management method, bee stings, and hive pests such as wax moths. He devotes several sections to the description of reproduction. In Book 21, sections 80–1, he discusses apiaries that were made of transparent stone so that the keeper could observe the bees' activities. He also discusses winter protection of hives and control of moths (most likely wax moths). He describes various kinds of honey (21.43–6) and briefly mentions how beekeepers may move their hives to fields of flowers. His confusion about caste, "kings," and drones makes it clear, however, that the level of understanding of some aspect of hive life was only partial.

Varro (*RR* 3.16.13) describes numerous crops known to be favored by bees; rose, wild thyme, balm, poppy, bean, lentil, pea, clover, rush, alfalfa, and snail clover. Columella (*RR* 9.4.4) lists acanthus among those "flowers which are much loved by bees." He also describes how to place hives so as to protect them from the wind (9.7.4–6). For ailing bees, Varro (*RR* 3.16.3) recommends snail clover, while Vergil (*Georgics* 2.97) suggests powdered galls with dried rose as a remedy. Pliny (*HN* 30.58, 62, 73, 107) recommends honey in which bees have died as a treatment for a variety of human illnesses.

Wasps, hornets, ants, and gall wasps, although known, are covered in much less detail by Pliny (*HN* 11.71–4, 108–11), with emphasis being given to descriptions of nest building, food gathering, stings, and the commercial importance of galls. The predatory nature of ichneumonids (*ichneumones*) is also described (*HN* 11.72) – yet another indication of the acuity of the ancients' curiosity. The role of parasitic wasps in the suppression of insects, however, was generally not as fully appreciated by the ancients as was, for example, bird predation on grasshoppers. The minute size and cryptic habits of many parasites (wasps and other insects) undoubtedly explains why they went unnoticed.

CARBONIZED MATERIAL

Cynipid galls that were found in a container (most likely a dolium) in a shop on the Decumanus Maximus (Fig. 260) in Herculaneum are the oldest examples of hymenopteran products in trade (Larew 1987, 1988) and resemble present-day galls caused by cynipid wasps in the genus *Adleria*. They were most likely sold for medicinal purposes, or for dyeing or tanning. Cursory examination of the large collection of preserved galls in the *deposito* at Herculaneum (Larew, unpublished) suggests that such specimens have more to tell (Fig. 261). For example, Dioscorides noted that galls without exit holes (through which the insect emerges) are the best, most tannin-rich galls. Interestingly, most of the Herculaneum galls have no exit holes. When I opened one gall without exit holes, remnants of a wasp (either the gall former or a parasitoid) were revealed (Fig. 262). Clearly, as more of these galls are examined, we will have a sharper picture of how galls were used in ancient times.

SCULPTURE

Highly stylized insects carved in the Eumachia frieze (Fig. 263) close to an acanthus blossom (in keeping with Columella's observation, cited earlier) resemble bees or butterflies. Their pointed abdomen, short antennae, and vertical flight posture are suggestive of a bee, but the full wings and waist resemble those of a butterfly. There are no known illustrations of hives. This is curious given the interest in honey and beekeeping. Matteucig (1974a) lists no bees in his inventory of animals from the ruins.

Insects that resemble ants are carved in the Eumachia frieze. One (no. 97 in Matteucig's list, 1974b) is in the beak of a small bird, while another (Fig. 264) is crawling up the frieze. Both are stylized but are indicative of wingless ants, which typically have small heads, a large abdomen, and a constricted "waist." Matteucig (1974a) identified these as *Formica rufa*. Such a definitive identification is questionable.

4. ORDER LEPIDOPTERA

English, butterfly; Italian, *farfalla*
English, moth; Italian, *tarma, falena, tignola, tarla*

FIGURE 260 *(Above)* Shop on the Decumanus Maximus, Herculaneum, in which galls were found in *dolia*. Photo: H. Larew.

FIGURE 261 *(Left)* Bag of preserved galls in the Herculaneum *deposito*.

FIGURE 262 *(Below)* Cutaway of a carbonized gall from Herculaneum showing remnants of a wasp.

FIGURE 263 Bee/butterfly-like insect, Eumachia. Photo: F. Meyer.

FIGURE 264 Antlike insect, Eumachia. Photo: F. Meyer.

> . . . it later becomes a caterpillar which as days are added grows larger, becomes motionless, with a hard skin, and only moves when touched, being covered with a cobweb growth – at this stage it is called a chrysalis. Then it bursts its covering and flies out as a butterfly (*papilio*).
>
> Pliny *HN* 11.116

EVIDENCE FROM ANCIENT AUTHORS

Pliny (*HN* 11.75) briefly discusses the silk moth (*bombyx*), clothes moth, and wax moth; he describes the comfort of clothing made from products of the first, and trouble caused by the latter two. Hornworms and assorted caterpillars are discussed briefly by Theophrastus (*Hist. pl.* 7.5.4 and 8.10.5) as plant pests. Cato suggests an olive oil, tar, and sulfur mixture as a repellant for caterpillars on grape vines (*RR* 95.2) and for moths in stored clothing (*RR* 98).

PAINTING

The butterfly appears in a number of wall paintings. In the garden painting of the House of Adonis (VI.vii.18) at Pompeii there was a butterfly on the left of the acacia bush (Jashemski 1979: fig. 67). Boyce (1937: 25 no. 36) describes two butterflies perched on the flowers in the lararium painting on the W wall of the peristyle portico of the House of the Cryptoporticus (I.vi.2). In a painting in the Naples Museum (inv. no. 9733) a butterfly hovers over 3 fruits of the strawberry tree that a black bird is about to eat (see Fig. 334) A humorous painting of a yellowish butterfly driving a chariot drawn by a griffin is reported by Helbig (1868) (no. 1550) and was originally in the Naples Museum, but has not been found in the collection in recent years. A similar theme is pictured on a Roman gem in which a butterfly drives a cart pulled by a peacock (Lippold 1922).

The beautiful garden painting details in the portico of the lower peristyle of the Villa of Diomedes at Pompeii have totally disappeared, but fortunately some details are preserved in an old publication. Butterflies are pictured twice (Figs. 109 and 265). Painted depictions of butterflies or moths have also been noted in the House of the Faun (first style frieze, oecus 44), in the Villa of the Mysteries (frieze above the second style *megalographia*), and in a still-life painting in the House of M. Lucretius Fronto (V.iv.11/a) (Castriota 1995; Tammisto 1997). Two butterfly/moths are depicted alighted on stylized sprigs of ivy in wall paintings of the ambient E of the Villa of Ariadne at Stabia (Longobardi 1997: fig. 99). The painting fragments of an earlier wall painting from House VI (*insula occid.* 42) include a stylized depiction of a moth or butterfly seemingly in flight.

FIGURE 265 Butterfly, roses, and wild strawberry, Villa of Diomedes.

FIGURE 266 Butterfly wings. Mosaic top from garden table in Garden of the Tannery, Pompeii (NM inv. no. 109982). Photo: S. Jashemski.

MOSAIC

A clear depiction of lepidopteran forewings is seen in a well-preserved mosaic that decorated the top of a table in the garden of the Tannery at Pompeii (I.v.2) (Fig. 266). The slim, highly patterned wings appear to belong to a moth in the Suborder Jugatae. The position of the wings directly beneath a human skull and above a wheel, as well as the symmetry of the mosaic, suggests a symbolic intent. The butterfly was the symbol of the soul among the Greeks, who used the same word ψυχή (psyche) for both soul and butterfly. The acanthus border of the fish mosaic (NM inv. no. 9997) from the House of the Faun (Castriota 1995, pl. 65) and the fruited garland border around the Dove mosaic (NM inv. no. 114281) in the House of the Doves (VIII.ii.24) (Castriota 1995, pl. 66) also contain depictions of butterflies or moths, as does the border around the basin in the atrium of baths in the House of Menander (Tammisto 1997, pl. 65).

SCULPTURE

Matteucig (1974b) describes two lepidopterans from the carved doorway at Eumachia, of least one of which (Fig. 263) (no. 1 in his list) is stylized such that it could represent a butterfly or a bee.

5. ORDER ORTHOPTERA

English, grasshopper; Italian, *cavalletta, locusta*
English, cricket; Italian, *grillo*
English, roach; Italian, *lasca*

> . . . they pass over immense tracts of land and cover them with a cloud disastrous for the crops, scorching up many things with their touch and gnawing away everything with their bite, even the doors of the houses as well.
>
> Pliny *HN* 11.104

EVIDENCE FROM ANCIENT AUTHORS

Of all of the insects, the locust (*locusta*) was considered the most damaging by the ancients. As indicated in Pliny's quote, accounts of their damage were graphic. Pliny also briefly discusses migration of swarms as well as sound production (a "grating" of teethlike structures at the shoulder blades – an observation that is remarkable for its near accuracy because the "song" is produced by rubbing the forewings together), mating, sexual dimorphism, and how locusts fall prey to birds.

Pliny confuses grasshoppers and crickets with the "cicada" (*tettigonia*) (Order Homoptera) – a confusion that continues today among the public. He describes grasshopper life cycles and the wings of tree-crickets. What struck the imagination of the ancient observer, however, was not always what we might expect. For example, Pliny did not describe at length the feeding habits of grasshoppers or the cryptic habit of many crickets. Instead he discusses in some detail how locusts can kill snakes, and marvels at accounts of three-foot-long locusts in India.

Pliny (*HN* 11.99) discussed the roaches (*blatta*) in a section devoted to describing different kinds of beetles (Order Coleoptera). He described them as a "nurseling of the shadow" that are "mostly produced in the damp warmth of bathhouses." He provides no other indication that cockroaches were considered the household pests they are today.

PAINTINGS

Recognizable depictions (paintings, sculpture) of this group are almost as numerous as those of butterflies. Although stylized, the distinctively prominent hind legs (femora), cylindrical body with tightly folded wings, and large head and antennae allow for easy recognition. A wall painting on the portico facing the large swimming pool in the Villa of Poppaea at Oplontis (Fig. 267) beautifully depicts a cricket/grasshopper resting on a vine with prominent ovipositor, cylindrical body, and jumping legs. The illustrated interaction with a plant reflects a natural association. Another painting on the same wall (Fig. 268; Jashemski 1979: fig. 477) shows a flying insect that resembles a grasshopper or butterfly by virtue of its prominent antennae and large head. A grasshopper was also pictured on the Villa of Diomedes at Pompeii in the portico of the lower peristyle (see Fig. 91). Two beautifully rendered images are depicted in fragments of an earlier wall painting in House VI (*insula occid.* 42). Both show grasshoppers with wings slightly open as if they are ready to alight or embark (Ciarallo and De Carolis 1999, pp. 58–59). The most fanciful depiction is a painting from Herculaneum no longer extant of a grasshopper driving a chariot that is being drawn by a green parakeet. It has been preserved in a line drawing (Fig. 269). A similar depiction on a gem shows a cricket driving a chariot drawn by two hounds (Furtwangler 1896: pl. 88). Kenner (1970: 25f) suggests that these chariot depictions may parody triumphant entries of rulers into Rome. Paintings of grasshoppers or crickets have also been noted in friezes in the House of the Faun and the Villa of the Mysteries (Castriota 1995; Tammisto 1997). A pair of grasshoppers/crickets is depicted on sprigs of stylized ivy (*Hedera*) on the wall paintings of Villa of Ariadne at Stabia (Longobardi 1997: fig. 99).

FIGURE 267 Wall painting of a cricket-grasshopper, Villa Poppaea, Oplontis. Photo: S. Jashemski.

FIGURE 268 Wall painting of a grasshopper or butterfly, Villa Poppaea, Oplontis. Photo: S. Jashemski.

FIGURE 269 Line drawing of a grasshopper in a chariot (Kenner 1970: fig. 8).

MOSAIC

The beautiful garland border in the Dove mosaic (NM inv. no. 114281) in the House of the Doves depicts grasshoppers or crickets perched on the ribbon that wraps around the garland (Fig. 270) (Castriota 1995; Tammisto 1997). Tammisto also noted a grasshopper in the basin mosaic in the House of Menander.

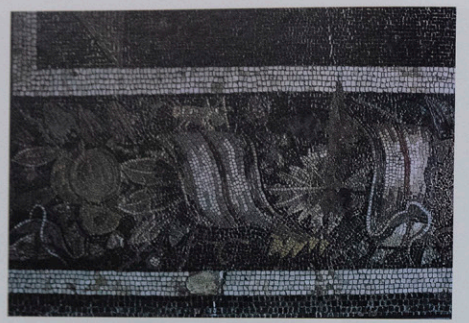


FIGURE 270 A cricket on a mosaic garland (NM inv. no. 114281). Photo: S. Jashemski.

SCULPTURE

The marble frieze of Eumachia at Pompeii has several excellent carvings of grasshopperlike insects (Figs. 259 and 271), some of which are near, or in, a bird's beak or a lizard's mouth. These associations between bird predator and grasshopper prey are some of the earliest and most striking illustrations of trophic interactions between vertebrates and invertebrates. The carver clearly depicted a behavior that indicated an understanding of the interdependence of life, not to mention biological control. Thus it is from bas-relief carvings of the Eumachia frieze that we see a rendering that begins to match the level of entomological understanding of the ancient writers such as Vergil, who speaks of birds that "carry off bees on the wing, dainty morsels for their fierce nestlings" (*Georgics* 4).

Matteucig (1974a, 1974b) identified eight crickets or grasshoppers from the Eumachia frieze and assigned four to species: *Acheta campestris* (no. 1 in his Table 1, 1974a); *Acridium lineola* (no. 2); *Tettigonia viridissima* (no. 20); *Anacridium aegyptium* (no. 61). He assigned two others to genus: *Gryllus* (no. 42) and *Acridium* (no. 85). This level of confidence, especially assignments to the species level, is surprising given the degree of stylization in the frieze. Furthermore, Matteucig (1974b) used his identifications of depicted insects and other animals in the frieze to argue that the entire frieze illustrates a seasonal calendar (*orologio biologico*) – an interpretation that is interesting, but rests on his somewhat unreliable identifications.

FIGURE 271 A cricket-grasshopper in a bird's beak, Eumachia. Photo: F. Meyer.

OTHER ORDERS

EVIDENCE FROM ANCIENT AUTHORS

At least three other orders of insects are mentioned by Pliny or Columella: Homoptera (cicadas, aphids, spittlebugs), Siphonoptera (fleas), and Neuroptera (lacewings). There is some uncertainty as to the last Order; the ancients may have been referring to mayflies (Order Ephemoptera), which also have large, highly netted wings and iridescent bodies.

DEPICTIONS

A small (6 cm long) carving of a cicada in high quality rock crystal from India was discovered in Pompeii (I.ii.3) on April 12, 1873 (*BdI* 46, 1874: 202) and is now in the Naples Museum (inv. no. 109629). Morge (1973) mentions a Pompeian mosaic that shows a cicada as the driver of a coach to which a parrot is harnessed, but no further details are provided. Matteucig (1974a) lists *Cicada orni* (Order Homoptera) as having been depicted in the Eumachia frieze. Otherwise, depictions from these orders are lacking. In the case of fleas, this is not surprising given their small size, but the eye-catching wings of

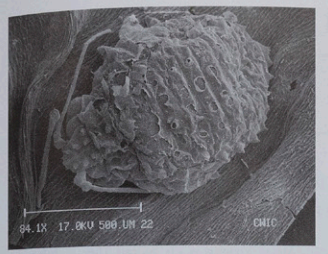


FIGURE 272 Aphidlike insect, *villa rustica*, Oplontis.

the lacewings and/or mayflies suggests that some were most likely depicted in yet unknown decorations.

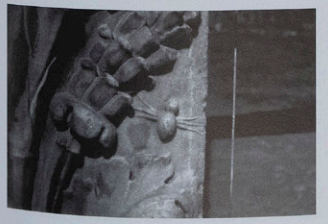
CARBONIZED SPECIMENS

What has been tentatively identified as a larva of an unidentified insect on a clover leaf in carbonized hay from the *villa rustica* at Oplontis (see Jashemski 1979: 326, fig. 517) may actually be an aphid because it appears to have syringelike (stylet) mouthparts (Fig. 272). The examination of a pregnant young female killed when Mount Vesuvius erupted revealed that her hair had been virtually replaced by iron oxide and also contained an egg of the human head louse (*?Pediculus humanus* var. *capitis*). Head lice were apparently a common infestation during that ancient time (Capasso and Di Tota 1998).

COMMENTS

Given their bright color and flashy habits, it is surprising that dragonflies (Order: Odonata) are not mentioned by the ancient authors or depicted in the numerous murals of waterside habitats.

FIGURE 273 Spiderlike carving, Eumachia. Photo: F. Meyer.



ARTHROPODS OTHER THAN INSECTS

EVIDENCE FROM ANCIENT AUTHORS

Spiders, scorpions, ticks, and mites (scab mites) are discussed by the ancients. Scorpions, for example, were recorded because of their "sting." Livestock afflictions caused by ticks were discussed by Columella (*RR* 7.13.1), as was scabies (*RR* 6.32.1–3) – a skin inflammation often caused by mites. The predatory nature of spiders is documented by Pliny (*HN* 11.85).

SCULPTURE

Matteucig (1974b) lists the spider, *Aranea diademata*, as being depicted in the Eumachia frieze, but it is unclear as to which of the five spider carvings on the frieze that he identified (nos. 2, 41, 60, 67, and 89 in list) this assignment refers. All of the spiderlike organisms in the frieze are depicted with six legs rather than the correct eight (Fig. 273). The two body regions (cephalothorax and abdomen), however, are accurately carved, and this body structure distinguishes these arthropods from insects, which have three body regions.

Although unknown from depictions, spiderwebs were surely drawn; the symmetry and eye-catching dewiness of webs would doubtless have appealed to muralists of the time. Mites and ticks are so small as to perhaps be unknown to artists of the time. Depictions of scorpions are unknown.

CONCLUSIONS

Comparing what we know from ancient literature with the depictions and actual insect specimens from long ago makes one thing clear: Ancient written accounts provide a much more thorough and detailed idea of entomological awareness at the time of the eruption than do preserved specimens or depictions. Even if Matteucig's hypothesis of the Eumachia frieze as a natural calendar is correct, the depth of understanding described in written accounts greatly exceeds that exhibited in depictions. Just as surely, however, there remains undetected a wealth of depictions and specimens that will enrich future understanding of ancient entomology.

What can be said about the renderings and preserved remains that do exist? Those few depictions that are known confirm an early understanding of general insect morphology and behavior. Artists of the day included insects as part of a decorative aesthetic, and perhaps as symbolic images. They knew and cared enough about observing insects so as to represent them with sometimes striking accuracy, but usually with

license. Actual specimens confirm that insects were part of Campanian life in markets and gardens.

As new remains are excavated at these and other ancient sites, methods that capture insects and their parts (Costantini, Tosi, and Vigna Taglianti 1975–7) should be used. If new murals and mosaics are uncovered, accurate written and photographic records should be kept, and the best available means should be used to preserve the depictions. Entomologists should be included in excavation efforts.

ACKNOWLEDGMENTS

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15

AMPHIBIANS AND REPTILES

EVIDENCE FROM WALL PAINTINGS, MOSAICS, SCULPTURE, SKELETAL REMAINS, AND ANCIENT AUTHORS

Liliane Bodson

INTRODUCTION

Amphibians and reptiles, although to a far lesser extent than other animals, especially birds and mammals, are depicted in mosaics, wall paintings, bronze and marble sculptures, marble reliefs, terra-cotta statuettes, and gold jewelry (snakes only). Except for Matteucig's limited and often misleading paper (1974), there has been little attempt to systematically identify the herpetological imagery evidenced in the Romano-Campanian cities and other Vesuvian sites destroyed in A.D. 79. Even though often badly damaged, this imagery offers insights on the role and meaning of amphibians and reptiles in house and garden decor and in the life of the people of the Vesuvian region toward the end of the first century A.D.

ZOOLOGICAL FEATURES

Whatever the considered animals, yet in particular regarding amphibians and reptiles, the realism of the depictions is the primary condition of zoological identification, since many of these animals are rather variable. Identification to the genus or to the species can be made in limited instances only. Such identification generally requires an in-depth study combining the naturalistic characteristics, technical rendition, and intended religious, symbolic, or decorative significance (Toynbee 1973: 216–36). Some features are common to all ancient depictions of animals, others due to the imagery inherent in portraying toads and frogs, tortoises and turtles, lizards, snakes, and the like. As a rule, their representations must be examined closely both for their own sake and against all relevant ancient reproductions of the same or of related animal species (see Tammisto 1997: 9–10, regarding birds), much as are actual specimens on the basis of a sophisticated procedure starting with their zoogeographical origin and entailing direct examination and comparison with elaborate identification keys (Arnold, Burton, and Ovenden 1978). It is worth noticing at once that general body proportions, head shape, colors, and patterns, although they are helpful, are not critical characters of most amphibians and reptiles.

TECHNICAL RENDITION

Understandably, the ancient Greek and Roman representations of amphibians and reptiles do not meet the modern standards of zoological illustration intended for Linnean identification (see Hammond 1998). Nonetheless, direct examination of the ancient evidence is the most dependable way of not leaving out significant clues. Indeed, some that prove to be significant are not detectable in two-dimensional images (Bodson 1981: 78). For the present study, however, only published illustrations and photographs were available, in books, exhibit catalogues, slides, and prints. Few of them were close-ups, enlargements, or multifaceted shots of three-dimensional objects that could have partially counterbalanced the distortion of indirect examination.

Various materials were used in making decorative domestic reliefs, statuettes, fountain spouts, and jewels showing reptiles and amphibians. These materials, their techniques, and the artists' greater or smaller accomplishments imposed the varying degrees of herpetological realism observed in ancient depictions. Terra-cotta and metal, especially gold in jewelry, favor the rendition of patterns of snake scales and of toad warts. Wall