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ORDINARY MEETING, MARCH 7, 1887.

THOMAS CHAPLIN, ESQ., M.D., IN THE CHAIR.

The Minutes of the last Meeting were read and confirmed, and the following Paper was then read by the Author :—

ORIENTAL ENTOMOLOGY.

By the Rev. F. A. WALKER, D.D., F.L.S.

THERE can be no doubt but what the naturalist labours under certain special disadvantages in collecting in the East. For example, if he happen to be in Syria or Palestine, the chances are that he will be on horseback the greater part of the time, as the only means of travelling, owing to the heat and the stony hill-sides, and will on that account fail to capture many an insect.

Difficulties
of collecting
in the East.

Again, the traveller in a distant land, or even in an unfamiliar spot (for this remark must not be understood as only applying to the East), through ignorance of the particular plant affected by this or that caterpillar or perfect insect, or, at all events, where the plants in question grow, may waste his time in fruitless search, and may be more successful on the last day of his stay, if he finds the flowers he has been looking for, than during all the rest of the time put together.

By the term "Oriental Entomology" are to be understood all species of insects found in the East, not only those peculiar, or nearly so, to that region, but such as occur also in many other lands. This paper, naturally, only has reference to those parts of the East that the writer has personally visited, and where he has consequently observed and collected—namely, various places in Egypt, Palestine, Syria, Asia Minor, Turkey, Greece, on the first occasion; and Egypt and Nubia on the second.

Oriental
Entomology
—what it
must be
understood
to signify.

Three different types of Eastern butterflies (Lepidoptera Rhopalocera).

Such butterflies as fell under my observation in the East may conveniently be divided into three different types, for the better distinction and comprehension of the same; namely:—

1. English.
2. Mediterranean littoral.
3. Purely Eastern.

Typical British butterflies observed in the East.

I propose to term such species "Typical British Butterflies" as may be ordinarily seen in the course of a summer day's walk, and are ordinarily common and abundant at home, and not all the British kinds, including our rarer and more local, occurring in the East. For example:—

1. *P. Brassicæ*, Alexandretta, April; Corfu, June.
2. *P. Rapæ*, Philadelphia, May.
3. *A. Cardamines*, Ephesus, May; near Athens, June.
4. *C. Edusa* { near Jaffa, April 10; Shtora, April 18;
Philadelphia, May 10; Corfu, June;
and very generally distributed all along
the Mediterranean.
5. *S. Janira*, Corfu, June; Athens, June.
6. *P. Alexis*, Ephesus, May; Corfu, June.
7. *C. Phlæas*, Ephesus, May.
8. *V. Urticæ*, probably Corfu, June.
9. *V. Cardui*, road to Marathon, ditto to Laurium, June.
10. *V. Atalanta*, Corfu, June; Athens, May.
11. *G. Rhamni*, near Alexandretta, April; Belgrade, May.
12. *S. Megæra*, Corfu, June.
13. *C. Pamphilus*, Belgrade, May.
14. *P. Linea*, Acropolis, Athens, May.
15. *P. Sylvanus*, road to Marathon, June.
16. *P. Machaon*, Ephesus, May.
17. *A. Cratægi*, Ephesus, May; Deceleia, June.
18. *L. Sinapis*, Corfu, June.
19. *S. Semele*, Eleusis, May; Lycabettus.
20. *A. Galatea*, Acropolis, May; Lycabettus.
21. *M. Cinxia*, Belgrade, May.
22. *T. W. album*, Deceleia, June.
23. *T. Rubi*, Deceleia, June.
24. *A. Lathonia*, May.
25. *P. Daplidice* { Between Jerusalem and Jericho, April 4;
Jordan, April 5;
Philadelphia, May 10;
Colonos and Ceramcicus, Athens, June.

Local British butterflies observed in the East.

Rarest British butterflies observed in the East.

Twenty-five out of our total number of sixty-six British butterflies are here set down as coming under my own obser-

vation during the four months I spent in the East in 1882. No doubt there are some other kinds found equally in England and the East that I did not happen to come across.

1. *P. Podalirius*, Baalbec, April.
2. *P. Alexanor*, Ephesus, May.
3. *G. Cleopatra*, road to Marathon, June.
4. *M. Didyma*, Corfu, June.
5. *V. Egea*, Philadelphia, May.
6. *L. Camilla*, Prinkipo, May.
7. *Minois Actæa*, road to Laurium, June.
8. *Minois anthelea*, Deceleia, June.

Butterflies
typical
of the
Mediterranean
littoral
observed in
the East.

The geological formation of several of the countries bordering the Mediterranean is almost identical as regards the limestone hills, rocks, and boulders. Similarly the dark-red earth beneath the olive-groves on the sloping shores of Corsica closely resembles in colour the soil under the same trees on the sides of the hills of Judæa. Thus Palestine, Syria, Attica, are akin to a considerable extent in reference to the nature of their respective coast-line. From the identity of the geology follows, as a matter of course, a sameness to a great extent in the respective botany of these different lands, and again from the sameness of the botany follows the corresponding character of the entomology of these various countries.

Mediterranean
littoral—
what is intended by.

The term "Mediterranean littoral" was used by Dr. Post, the well-known Professor of Botany in the American College at Beyrout, to denote the geographical distribution of plants along the said shores. On the present occasion it will be found convenient to apply it to the range of certain species of insects.

Eastern lands have this in common with the rest of the "Mediterranean littoral," of which they form a part, that three of the European species of *Papilio*, or Swallow-tail, are found there. Only one kind occurs in England, only two in France and Germany; or, if the third kind occurs at all in France, it will only be in the extreme south—as, for instance, the neighbourhood of the Pyrenees. I have myself seen and captured the three kinds in the East, though not all three in the same place.

Fauna of the
Mediterranean
littoral—how
exemplified
in Eastern
Entomology,
in respect of
the *Papilio*s.

The said three are as follows:—

<i>P. Machaon</i> , England,	{ Generally distributed on the Continent,	} The East.
<i>P. Podalirius</i> .	{ Generally distributed on the Continent,	} The East.
<i>P. Alexanor</i> .	South of Europe.	The East.

P. virgatus. It may be remarked that the Eastern real or supposed variety of *P. Podalirius* has received another name, *P. virgatus*, owing presumably to some difference in the stripes. The specimen of *P. virgatus* that I have had for some years in my cabinet is from Damascus; the one that was captured during my visit to the East is from Baalbec. If there be a distinction, as far as I can see, it is in the fact that *P. virgatus* has a narrower dark margin; *P. Feisthamelii*, the German variety (which has also a whitish in place of the primrose ground colour), a broader ditto than is the case with the ordinary type of *P. Podalirius*. *P. Machaon* was noticed at Ephesus, and on Mount Pagus at Smyrna. *P. Podalirius* was again seen at Deceleia and in Corfu. I pointed out *P. Alexanor* to my courier near the Sisyra quarter of ancient Ephesus, when he captured it, a large specimen, in fine condition, and the only one I have ever seen alive. I consider this insect as good a catch as any I succeeded in making in the East. As regards the fourth European species of *Papilio*, *P. Hospiton*, it does not enter into the present discussion, being exclusively confined to Corsica.

P. Feisthamelii. It would be going too far, perhaps, to assert, in the absence of further evidence than such observation as I have been able to bestow, that our three common species of *Pieridæ*, so abundant at home, are actually rare in the East. I can only say that I have never seen many of them there. I saw and captured one (female) of *P. Brassicæ* at Alexandretta in April, and one (male) of *P. Rapæ* at Philadelphia in May. On the other hand, it is certain that three other species of *Pieridæ*, either very rare or local with ourselves, are by no means so along the Mediterranean littoral, and that I caught all the said three kinds, and one of them in abundance, in the East. This will be best exemplified by the following statistics:—

Fauna of the Medi-terranean littoral—how exemplified in Eastern Entomology, in respect of the Pieridæ.

Synchloe Daphnice. 1. *Synchloe Daphnice*. Bath white. (Our rarest English butterfly, and never seen by me alive in England.)

Of this butterfly there are specimens in the collection belonging to Highgate School, captured at Rome and Milan by a relative, at Lido and Ajaccio by myself. Ditto in my own collection, and captured by me between Jerusalem and Jericho, and on the banks of the Jordan, at Colonos and Cerameicus, Athens, and at Philadelphia.

Leucophasia Sinapis. 2. *Leucophasia sinapis*. Wood white. (Only seen by me in the New Forest, in England.)

I have caught it in osier-beds near Martigny, at Gorla, Bellaggio, and, as regards the East, in Corfu.

3. *Aporia cratægi*.^{*} Black-veined white. (If I ever caught this butterfly, or even saw it alive in England, it is upwards of twenty-five years since.) I have caught it at Fontainebleau, Chamounix, Baveno, on the Lago Maggiore, and, as regards the East, in abundance at Ephesus, on the slopes of Mount Prion, and I have also seen it at Deceleia. *Aporia Cratægi*.

A *primâ-facie* reason for the non-appearance of the commoner sorts would seem to be the absence of the cultivation of cabbages and turnips, that serve as food-plants for the caterpillars of *Brassicæ* and *Rapæ*, to the same extent as at home; for, though there are market-gardens in the neighbourhood of Jerusalem, and on the site of the King's garden, mentioned by Nehemiah, close to the Pool of Siloah, these are principally devoted to the production of artichokes and salads.

Some specimens of one, *P. Brassicæ*, that I saw several years since in the collection made by Mr. Lord in Egypt, were, to the best of my recollection, both larger and yellower than our own, in consequence, in all probability, of the warmer climate. *Brassicæ of larger size in Egypt.*

The *Vanessas* constitute our gayest tribe of butterflies at home; yet those that I have seen are few and far between in the East; indeed, of *V. Egea*, which is not a British species, I saw (but, unluckily, failed to capture) one specimen in the dry bed of the Sari-kizi, or stream of the fair girl, at Philadelphia. This butterfly belongs likewise to the Mediterranean littoral, being found in the South of Europe. Perhaps *V. Atalanta*, *V. Io*, and *V. Urticæ* need our nettle, *V. Polychloros* our elm, as a food-plant. It is true that in one or two places I saw *V. Atalanta*—the Acropolis, for example, and Pass of Daphne; and *V. Urticæ* once,† I think, in Corfu; but these are only exceptions to the rule. I must have missed the right time and place for this particular genus, for that all our seven species of *Vanessa* are found in Asia Minor and elsewhere, I make no doubt, on reference to Kirby's *Lepidoptera*, and from what I have elsewhere read. *V. Antiopa* is mentioned in Canon Tristram's article on "Palestine" in the *Dictionary of the Bible*, and is, no doubt, far *Absence of Vanessas in the East.*
V. Egea.
V. Atalanta.
V. Urticæ.
V. Antiopa.

* I took this in unlimited quantity about Torquay in May and June, 1855.—H. B. Tristram.

† These come out in the hilly and oak-clad parts in July and August. Plentiful in Bashan in July.—H. B. T.

V. cardui.

commoner there than with us. It does not follow, however, but what other species may be much less abundant there than at home. *V. cardui* proved literally the only abundant species of *Vanessa* on the Acropolis and elsewhere round Athens in May and June, 1882, and in Corfu also at that date, and in the neighbourhood of Cairo in the month of December, 1883. The occurrence of this butterfly, however, proves nothing in reference to the special entomology of a particular district, as it is cosmopolitan, like its food-plant, the thistle, from which it takes its name. It often appears in perfect swarms,* but is occasional and variable in that respect, though several specimens are seen every year. The best parallel to the species that remain to be considered may be found in the fauna of the South of France.

Compare the following table :—

Other
Eastern
butterflies of
the Medi-
terranean
littoral.

G. Cleopatra	Taken by my relatives and John Curtis, the author of <i>British Entomology</i> , in 1830. Montpellier	Taken by my father in 1872, Rome	Taken by myself in 1882, road to Marathon, June; Corfu, June
Anthocaris Belemia	Specimens in my cabinet believed to be from South of France, 1830		Taken by myself in 1882, between Jaffa and Latroon, March 28; Beyrout, April 11
Anthocaris Belia	Ditto		Taken by myself, Philadelphia, May, 1882
Limenitis Camilla	Taken by my relatives and John Curtis, South of France, 1830	Taken by myself, Bellagio, Sept., 1872	Taken by myself, Prinkipo, May, 1882
Minois Actæa		Ditto, Martigny, 1867, and road to Great St. Bernard	Ditto, road to Lausanne, June, 1882
Arge Titea	Ditto (then called Lachesis.)		Acropolis and Eleusis, May and June, 1882.†

* In all my five visits to Palestine I have found *V. cardui* literally in swarms.—H. B. T.

† Some of our own *A. Galatea* were also taken by me on these occasions. I was unable to distinguish *Galatea* from *Titea* on the wing. Canon Tristram retains the old name of *Lachesis* for the species now known as *Titea*. Similarly, in treating of the *Pieridæ* and *Satyridæ*, he keeps to the old generic names in vogue before the subdivision of genera. "*Arge*" is "*Hipparchia*," and "*Anthocaris*" "*Pontia*" in his list.—F. A. W.

Melitæa Didyma	Road to Great St. Bernard, 1867	Corfu, June, 1882
Lycæna Melanops	According to Kirby, found in South of Europe, and called Cupido Melanops	Alexandretta, April 28, 1882
Satyrus Semele	Road to Gt. St. Bernard, 1867	Neighbourhood of Athens, May and June, 1882
Epinephele Ida	According to Kirby, South of Europe, Algeria	Corfu, June, 1882
Argynnis Lathonia	South of France, 1830; Villers la Ville, near Brussels, 1857; Lucerne, 1865; Bellagio, Genoa, Pontresina, 1872	Philadelphia, May, 1882

This list might be further extended, but what has been already stated will amply suffice. As a matter of course, these artificial divisions, framed for the sake of convenience, will overlap one another to a certain extent; and some of the most characteristic species of the South of France, the Vallais (where, twenty years since, I saw more species of butterflies in one single day than I had ever seen in my life before), and the East at the same time, are also found, though very rarely (*Argynnis Lathonia*, for example), in England. *S. Semele* is also English, somewhat local, but abounding in limestone and slaty districts in North Wales and North of England, which resemble the geological formation in Greece; and the lower wings of the Grayling (which is its English name), when it is settled on a rock, can scarcely be discerned from the lichen that overspreads the boulder.

Thais may be regarded as an Eastern genus for all practical purposes, as nearly every collection from Palestine, or Syria, or Asia Minor contains either *T. Apollina* (*Doritis Apollinus* according to Kirby), *T. Cerisyi*, or both species. And *T. Apollina* is quite the commonest butterfly during the month of March in Palestine, where I captured it on the plain of Sharon, and also where it occurred in great abundance on the Mount of Olives. I have never met with any species of this tribe anywhere on the Continent; and though it be true that *T. Rumina*, for example, is found in the South of France, and its variety, *Medesicaste*, in Algiers, still this does not invalidate the general claim of the tribe to be regarded as a sub-tropical, thoroughly Eastern genus. It is, in fact, the representative in Asia Minor, Syria, and the Holy Land of *Parnassius*, in Switzerland. And *Thais Apollina* is no doubt termed so from the supposed similarity of its markings to those of the commonest Swiss species, *Parnassius Apollo*. I also caught this insect in the meadows in the vicinity of Baalbec and Shtora, where it disports itself on and among the

Purely
Eastern
species.
Genus *Thais*.

scarlet anemones, no less brilliantly-tinted tulips (*Ranunculus Asiaticus* and *Tulipa oculi solis*), Star of Bethlehem, and in the Plain of Sharon, among the variously-coloured vetches, and sundry other blossoms of the flowery plain or hill-side. Many of *T. Apollina* were in good, more in fair, condition. A perfectly fresh specimen of *T. Apollina* has a dark, gauze-like appearance over the whole of the upper wings, and a primrose tint (with the exception of the red and dark-blue of the ocelli that form the border) over the lower. In the case of a more worn individual, the gauze-like appearance is the first to go; in one still more faded, the primrose tint also, until the upper wings are nearly transparent, except for the three black spots which mark its affinity with the *Apollinidæ*. Whether or no the sexes are distinguished by the respective faintness or vividness of the markings, is more than I have knowledge in this instance to say. I was also fortunate enough to see six or seven specimens of *Thais Cerisyi* in Syria, and to capture three—two at Shtora, and one at Baalbec. I attributed its scarcity to the fact that I was too early in the field for this particular kind, but have had reason to correct this view, having been informed that I was even in the end of March and beginning of April too late, as it appears on the wing at the very commencement of the season, before *Apollina*.

Purely
Eastern
species.
Danais
Chrysippus.

Danais Chrysippus is a beautiful insect, and of striking appearance, with its wings of a golden bronze, spotted here and there with black, and its upper one having a black patch at the extremity, bordered by a transverse band of white. Its geographical distribution is a wide one, as it is found in most warm countries in the Old World, ranging from Turkey (in Europe) to Australia,—of course, with some local variations, according to the particular habitat. In fact, all species of the *Danaidæ* are fine, and notably so *Danais Archippus*, a still larger and more magnificent kind, and a native of the United States. I am led to mention this particular species (*Danais Archippus*) from the fact that it has recently been successfully naturalised in England, Australia, and, I believe, the Fiji Islands; and notices of its appearance in England were sent from time to time to the *Entomologist*. To revert to *D. Chrysippus*, all the numerous specimens that I have captured were taken at or near Cairo (and I have never seen it alive elsewhere) in December, 1883, on geraniums and other bedding plants in the public gardens; settling on the poinsettias in the Island of Roda; and flitting about the tall zinnias which grow to a height of seven feet and upwards in the gardens of Matareeyeh at the famous

Heliopolis. The effect of this fine butterfly fluttering round a scarlet poinsettia in the bright sunshine was truly gorgeous, and so excited was I when I first saw it alive and flying round the bedding plants in the gardens of the Esbekeeyeh, that I struck wildly with my net, and thus missed securing my first specimen,—so unusual is the appearance of a tropical butterfly of large dimensions when seen by an Englishman flying in its natural habitat for the first time.

The fauna of Egypt, Palestine, and Syria, &c., are neither by any means so showy nor so numerous as those of Rio and of Port Natal; nevertheless, our knowledge of tropical species from many localities is more complete. As a proof of this may be cited the fact that I took a *Ypthima*, sp. ignot, in the neighbourhood of Alexandretta, and in the direction of Issus, on April 30, 1883, which I showed on my return to Mr. Butler, at the British Museum; but he could not find that it corresponded precisely with any species of that genus contained in the National collection. I had previously (April 12) netted one or two of the same species along the road winding up the cliff above the Nahr-el-Kelb, or Dog River, Beyrout; but, most unfortunately, these were completely spoiled for specimens by getting rubbed and broken when still in the net, owing to my horse shying in consequence of some Orientals, who think nothing can be done without clamour, making a great noise on the steep and narrow path. In connexion with this subject, it may not be out of place to mention that I captured two specimens of a *Deudorix* on the 29th of November, and two again on the 1st of December, in the public gardens at Cairo. In these instances, also, the species is uncertain. Mr. Butler has compared them with those in the National collection, and finds that they approach most closely to an Indian species, but is inclined all the same to think that they are not the same, because of the wide geographical distance interposed, there being no specimens from any part of the intervening region of Arabia. Kirby enumerates twenty-nine species of *Deudorix*, by far the greater number (twenty-four) from India and the East Indian Islands, one from Australia, one from Sierra Leone, one from South Africa, one from Natal, and one from Mozambique. My specimens of *Deudorix* are about the size and of the tawny hue of our own *C. Pamphilus*; with short tails, however, and with a dusky margin round the upper wings, and round a portion of the lower. My *Tarucus Nara*, from Cairo, November 29, is the *Cupido Nara*, of Kirby; locality, India bor. according to him. My *Zizera Karsandra*, from the gardens of Gezeedeh, Cairo, December 1, is his *Cupido Karsandra*; India bor.;

Purely Eastern species. Eastern entomology only imperfectly known. *Ypthima*, sp. ignot.

Deudorix, Nov. 1, Dec., 1883.

Tarucus Nara, Cairo. *Zizera Karsandra*, Gardens of Gezeedeh, Dec. 1, 1883, Cairo.

Melitæa
Trivia,
Ephesus,
May, 1882.

Eastern
Skippers,
Pamphila
Nostradamus,
Gardens of
Gezeedeh,
Dec. 1, 1883,
Cairo.

Erynnis
Alcææ,
Acropolis,
May, 1882.
Lycæna
Bætica,
Cairo,
Dec. 10,
1882.

Which
country of
those I
visited in the
East to be
regarded as
the most
productive
of
butterflies.

occ. North-West Provinces, in short. And to Melitæa Trivia, of which I took four specimens in May round the ruins of St. John's Church, Ephesus, Kirby assigns Northern and Western Asia as its habitat. In reference to Skippers, I caught six specimens of Pamphila Nostradamus in the gardens of Gezeedeh on December 1. This species is recorded by Kirby from South Europe, Asia Minor, and North Africa. Erynnis Alcææ, of which I only captured one specimen at the Acropolis, in May, 1882, is, according to Kirby, found in North Africa, North and West Asia, and in Europe. I must not omit to make mention of Lycæna Bætica, according to Kirby Cupido Bæticus, which I caught in or near Cairo on December 10. The specimens I had previously in my cabinet are labelled India, and it would seem to be widely distributed over three continents, as Kirby records it from South Europe, South Asia, as well as Africa. It was first noticed on our English coast about or nearly thirty years ago. In common with several tropical species of Polyommatus, but unlike every English one in this respect, it has short tails, similar to those of a Thecla, and is also found a long distance up the Nile, as, if my memory serves me rightly, I noticed it at Aboo Simbel, nearly 900 miles from Alexandria.

Rightly to determine which country in the East is most productive in butterflies, Egypt, Palestine, Syria, Asia Minor, Turkey and Greece ought all to be visited in successive years, and for the same period of the year,—four months, say, from the beginning of March to the end of June. Then, given equally favourable conditions of weather, a comparison might fairly be instituted, and some adequate conclusion arrived at. But if the traveller, as was the case with myself, happens to be in March in Egypt, in March and April in Palestine, in April in Syria, in May in Asia Minor and Turkey, in May and June at Athens, and in June at Corfu, the chances are that, as the summer advances, he will capture most kinds of butterflies in the country he visits last. It is needless to remark that he must bear in mind all the kinds he sees, not only what he succeeds in capturing, and that whichever country he is in, probably some of the March kinds will have disappeared at the end of May, and so on, and that not only the number of species belonging to any particular district, but the number of purely Eastern species, is to be taken into account.

Compare the accompanying rough calculation of my captures in 1882 of various butterflies in the order of the different countries as I travelled :—

Egypt	0	} Species. {	This list does not include those kinds that I saw without catching, and possibly not quite all that I caught, but the relative proportions, at any rate, are correct.
Palestine	4		
Syria	9		
Asia Minor	13		
Turkey	8		
Greece	16		
Corfu	6		

The reason why I captured fewer species in Corfu than in Athens, though I visited Corfu last, was because I stayed a shorter time there, and had already at Athens possessed myself of some of the kinds that I afterwards saw at Corfu.

Also, compare the accompanying table of what may be regarded as purely Eastern species:—

<i>Egypt</i> , 1883.	<i>Asia Minor</i> , 1882.	<i>Greece</i> , 1882.	<i>Syria</i> , 1882.
Zizera Karsandra	Melitæa Trivia	Erynnis Alcæe	Yphthima
Pamphila Nostradamus	(Ephesus).	(Athens).	(Alexandretta).
Tarucus Nara			
Deudorix			
Danais Chrysippus.			

Egypt has not many species, but those she does possess are truly Oriental. This refers to my second visit there. On my first I only saw European Pieridæ, which I failed to catch.

Canon Tristram's experience of collecting in Syria will best be given in his own words:—"When last in Syria (for six months in 1881), I saw many of the genus *Hipparchia*, and a few large *Satyrids*, too, in the wooded districts between Mons Casius and the bend of the Orontes; but I had neither the time nor means for collecting, as I was travelling light, without tent or equipage. I have just looked into my cabinet of what I collected in Palestine in 1872, and I see *Papilio Machaon*, *P. Podalirius*, and *P. Alexanor*. *Thais medesicaste* I got, and I think in my last visit I saw *Thais polyxena* common in places. Of *Pontia* I have *P. Eupheno* very common. Also *P.* ——— allied to *P. Belia*, but with the underside of lower wing broad bands of silver, instead of blotches very common. *Gonepteryx Cleopatra*—*Colias Hyale*. I think I saw often *Colias aurora*, but only in my last visit. *Hipparchia galathea* very common. I got also what I believe to be *H. Lachesis Libythea Celtis*—North Syria. *Limenitis camilla* (?), and *lucilla*, an *Apatura*, and a *Charaxes* (?) *jasius*. The *Polyommata* and *Fritillaries* were too numerous to attempt. For all *Rhopalocera* Mount Casius in July is the spot of Syria for the collector."

Experiences of others in reference to Oriental entomology. Extract from Canon Tristram's letter respecting the *Rhopalocera* of Syria and Palestine.

P. Belia. (?)

Lachesis = *Titea*.

From what is above stated, and is attended with circumstances of additional interest from Canon Tristram's wide

and repeated experiences of Eastern travel, and his correspondingly great knowledge of the Oriental fauna, it will be noticed that some of the species—the large Satyridæ, for example,—that he captured in Syria are probably identical with those that I caught in the neighbourhood of Athens. So, too, in reference to *G. Cleopatra*; the kinds are the same as regards us both, but the particular Eastern locality different. His longer list of Rhopalocera of Syria and Palestine may also fairly be attributed to the fact that the Canon has paid more visits, visited more districts, and later on in the season, than I have had the good fortune to do, and similarly there are some species enumerated by him in the passage I have just quoted that I have never seen alive anywhere; *P. Eupheno* and *Charaxes Jasius* to wit, *Colias Aurora* also, and *Thais Polyxena* (supposing this last butterfly to be distinct from what I know as *T. Cerisyi*), and *Libythea Celtis* also.

Extract from Canon Tristram's account of the butterflies of Palestine in the *Dictionary of the Bible*.

To proceed to Canon Tristram's account of the "Natural History of Palestine," in *The Dictionary of the Bible*, I must not fail to omit his mention of the genus *Vanessa*, the more especially as my own observation of that particular group has proved so scanty. In vol. ii., page 691, we are told: "The gorgeous genus *Vanessa* is very common in all suitable localities; the almost cosmopolitan *Cynthia Cardui* and *Vanessa Atalanta*, *V. L. album* and *V. Antiopa* may be mentioned." The *V. L. album* here recorded is the same as the *V. Egea*, of which I saw one at Philadelphia, and according to the Canon's account somewhere else, I think in a letter, *V. Io* is also plentiful in Palestine. I can fully endorse the reality and importance of his concluding observation in his article on "Palestine," when he says: "If the many travellers who year by year visit the Holy Land would pay some attention to its zoology by bringing home collections, and by investigations in the country, we should soon hope to have a fair knowledge of the fauna of a land which, in this respect, has been so much neglected, and should doubtless gain much towards the elucidation of many passages of Holy Scripture." I have also witnessed for myself the following fact, that "the Apollo butterfly of the Alps is recalled on Mount Olivet by the exquisite *Parnassius Apollinus*. This butterfly has been variously termed

Thais	}	Apollinus
Parnassius		or
Doritis		Apollina.

A synonymic list of the butterflies of the Holy Land would

be of real service, as the few particulars in which I feel myself compelled to differ from the Canon arise almost altogether from the diversity of names employed to indicate certain species.

The Rev. J. G. Wood has caused three kinds of Syrian butterflies to be figured in his illustrations of "Bible Animals," namely,—

Anthocaris glauce
Hipparchia Persephone
Papilio virgatus,

Rev. J. G.
Wood's
illustrations
of Syrian
butterflies in
his *Bible
Animals*.

and of these *Anthocaris glauce*, which he calls the Syrian orange-tip, is the *Belemia* of my catching above recorded—*Euchloe Belemia* according to Kirby. The butterfly that Mr. Wood calls *Hipparchia Persephone*, and which he names the Syrian grayling, is termed *Hipparchia anthe* in my collection. I never saw or caught it, however, in the East myself. My two specimens that I had before are labelled Europe as regards habitat, and Kirby assigns as its locality South Europe and Western Asia. The third species, *Papilio virgatus*, has already been fully discussed.

Of *Lepidoptera Heterocera* I have it in my power to state very little. Whether the scarcity of moths is to be attributed to the coldness of the atmosphere after the sun has set in regions where the wind blows uninterruptedly across the desert, with no intervening obstacle or shelter to break its force, or to the short duration of a Syrian twilight, or to the scanty amount of wood, and, at all events, of large timber in many places, or to all these causes combined, is a matter of opinion. Granted that there were trees of requisite size for sugaring, and in a suitable situation for pursuing that method of attracting moths, it would be absolutely unsafe to examine the trunks after nightfall in the neighbourhood of any Eastern town or village, unless attended by an armed guard. There are no evenings, as with us, at the same time close, cloudy, and damp—such as moths love—in lands where there is literally no haze or fog whatever to obscure the distant view. All that I have to state, therefore, with regard to moths seen in the East is taken from my article on this subject in the *Entomologist* for the month of January, 1886, and is as follows:—

Hypothetical reasons assigned for scanty number of moths (*Lepidoptera Heterocera*) observed in the East.

"Of moths, the number of species is very scanty, so far as my personal observations went—to wit, *Saturnia pyri*, at Beyrout; *Arctia villica*, on the banks of the Meles; *Zygæna brisæ* in the Stadium, and *Pnyx* at Athens, and *Z. carniolica* in the Pass of Daphne; *Dasydia obfuscata* (Scotch annulet),

Enumeration of moths captured in the East.

at Alexandretta; *Venilia maculata* (speckled yellow), at the entrance to the Wady Ali; and, on my second journey, *Chærocampa celerio*, at the New Hotel, Cairo, in December."

Sphinx
Nerii.

Lastly, to quote once more from Canon Tristram's article: "The caterpillar of the magnificent *Sphinx nerii* feeds in swarms on the oleanders by the banks of the Jordan."

Best method
of preserving
Coleoptera
captured in
the East.

It will, I think, be found advisable to transfer Coleoptera shortly after the specimens are taken, and, at all events the larger species, to spirits, until the traveller has the requisite leisure and space to arrange his collection on his return home. Otherwise, on the supposition that the Coleoptera are pinned in a box in the course of his journeys, some kinds (if the box be kept closed and never exposed to fresh air) are apt to snap asunder and become very offensive,—notably the *Ateuchus sacer*, or *Scarabæus* of the ancient Egyptians, from the circumstance of what constitutes its daily diet, not to particularise further, it being one of those which are popularly known as scavenger beetles. On the other hand, if the insect-box be opened for ventilation, the misfortune that befel me may be the lot of another collector. When staying at the New Hotel, Cairo, I lost the Coleoptera, &c., I had collected in the vicinity of the Pyramids from the following cause. The sashes of the French window in my bedroom were open one afternoon, and my insect-box was left open on a settee close to the window. A rat must have climbed up the stem of the banana in the front garden, thence, by the long leaves which reached the verandah, on to the parapet, and thence, doubtless by the open casement, into the room, where he proceeded to devour the contents of the box, leaving nothing but the pins strewed about, along with some stray legs and wings. The said verandah communicates with three or four apartments, and a colonel of our British force quartered in Cairo, whose room was on the same floor, had to lament the loss of his candles on that same afternoon. If it could be shown on sufficient grounds, from testimony that I or others are able to adduce, that a considerable similarity exists between the respective Coleoptera of the various countries bordered by the Mediterranean littoral, a valuable argument might be founded on this fact as establishing the connexion between the geology, botany, and entomology of a district—perhaps a more reliable argument than even in the case of the butterflies, as Coleoptera are not so apt as Lepidoptera to wing their way from land to land, and though most species have wings, they do not always—I might say in many cases, do not frequently—use them. Some kinds only fly at dusk, and it is therefore

*Ateuchus
Sacer,
Scarabæus*
of the
ancients.

Eastern
Coleoptera,
in connexion
with the
Mediterranean
littoral.

without any difficulty that they can be taken in broad daylight; they do not successfully elude the collector, like a startled and swift-flying Rhopaloceros insect, so that in the case of beetles, perhaps more so than in that of any order of insects, the number of those captured corresponds with the number seen. There are three places where eastern Coleoptera may ordinarily be collected,—in flowers, under stones, and on refuse; in other words, (1) when adhering tightly by their forelegs to the middle of flowers, frequently that of the variegated thistle or opium poppy, as noticed at Philadelphia, Sardis, and the neighbourhood of Athens; (2) under stones, as on the slopes of Aceldama; (3) on refuse in the road, as at the villages of Junin and Kaukab in the vicinity of the Pharpar, and near the scene of St. Paul's conversion, and elsewhere.

Three places in which to look for Eastern Coleoptera—
in flowers, under stones, and on refuse.

The remainder of this paper is chiefly a reproduction, with a few additional details, of the account I forwarded on this subject to the *Entomologist* of February and of April, 1885.

During my first visit to the East I captured 38 species of Coleoptera in Greece, 34 in Asia Minor, 21 in Syria, 18 in Palestine, 15 in Turkey, 7 in Egypt. On my second expedition I only captured 8 species of Coleoptera, 5 in Egypt and 3 in Nubia, but should have brought home a greater variety from Egypt if it had not been for the above-recorded deprivations of a rat. The difference in the number of species respectively noticed in the different countries may possibly be attributable, to some extent, to the time of year when the various localities were visited; and there are additional grounds for entertaining this hypothesis in the fact that the later the period the larger the number of species found. For example, 7 in Egypt (in the month of March), 18 in Palestine (March-April), 21 in Syria (April), 34 in Asia Minor (May), and 38 in Greece (May-June). Only 13, it is true, were noticed in Turkey in the month of May, for the simple reason that a great part of my time was spent in visiting the public buildings, instead of in the open country. The genus *Oxythyrea* had a wide range, occurring alike in Palestine, Syria, Asia Minor, Turkey, and Greece. Two species of this tribe were found in great abundance in cinctella and hirtella, and for the most part, as was also the case with many of the *Cetonias*, when tightly ensconced in the middle of a flower. I never saw any kind of beetle anywhere in such countless profusion as the showy orange and black-spotted *Mylabris quadrimaculata*, on the ears of ripe corn during my return drive from Deceleia, on the 1st of June, at the close of a bright and hot day. Some few good sorts were found beneath stones; seven specimens, for example, of the rare

Which country of those I visited in the East the most productive of Coleoptera.

Wide range of Genus *Oxythyrea*.

Description
of various
species of
Coleoptera
caught in
the East.

Nebria hemprichii at Aceldama, on April 3, and *Chlænium spoliatus*, *C. vestitus*, *Anchomenus austriacus*, and such-like metallic Coleoptera, on the wet ground in the vicinity of the great Bend, or reservoir, of Sultan Selim, that had recently overflowed its boundary, on the 25th of May, at Belgrade. *Anthia sex-maculata* (variegated black and white) is the handsomest, decidedly so, of the very few species I saw in all Egypt, and was taken running about the sand-heaps that are silted up by the action of the desert winds around the clumps of tamarisk, at El Ferdane and elsewhere in the neighbourhood of the Suez Canal. *Ateuchus sacer* was found also in the desert, and at the Pyramids of Geezeh, but far more plentifully on the road to Laurium and Marathon, two months and a half later. Of the eight species of Coleoptera that I came across on my second visit to Cairo, and in my voyage up the Nile, one kind only was plentiful (*Steraspis squamosa*, one of the green metallic Buprestidæ), and of this bright-coloured beetle there were any amount, as it swarms on the tamarisks (January–March) at Erment, the ancient Hermopolis, a short distance up the river south of Luxor, and at that latter place a large number had been stored since the preceding season, in a terra-cotta gourd, for sale to tourists in December.

Identity of
Orthoptera
noticed in
the East
with those in
other parts
of the Medi-
terranean
littoral.

Respecting Orthoptera, there is comparatively little to relate; the identity of the species I came across in the East with those in other parts of the Mediterranean littoral will be best ascertained by reference to the following table:—

<i>Acridium Tataricum.</i>	
1872.	1882.
Lido.	Beyrout.
Ajaccio.	Alexandretta.
Solfatara.	Road to Marathon.
<i>Mantis religiosa.</i>	
1872.	1882.
Ajaccio (November).	Beyrout (April).
<i>(Edipoda germanica (red variety)).</i>	
1872.	1882.
Switzerland.	Alexandretta.
Italy.	Pharpar.
Corsica.	Belgrade.
	Road leading to Marathon.
<i>Tryxalis nasuta.</i>	
1872.	1882.
Bellagio.	Jaffa.
Lido.	
Florence.	
Ajaccio.	

Or, to go more into particulars, I discovered the red variety of (*Edipoda germanica* (or *fasciata*, as it is more correctly named) to be as widely distributed in the East as previous experience had made me acquainted with its occurrence in Switzerland, Italy, and Corsica, for I found it on the banks of the Pharpar on the 19th of April, where it took its short flights amid the corn; and again in the neighbourhood of Alexandretta, in the direction of Issus, on the 28th of the same month, as we toiled up among the myrtles, pomegranates, Portugal laurels, and styrax trees, beneath a very hot sun, to the ruins of the old castle of Merkes, two hundred yards from the shore; and, lastly, I noticed it on the road leading to Marathon, on the 5th of June, as also previously at Belgrade, on the 28th of May. *Acridium tataricum*, a locust with smoky-brown wings, likewise a common species in Italy and Corsica, was also found near Alexandretta, on the road to Marathon, and at Beyrout as well. Of *Mantis religiosa* I obtained a specimen off the orange-trees in the island of Roda, in March, and another, clinging to a bough of *Ficus elasticus*, was brought me at Beyrout, in April. There are also several grasshoppers that I collected in Palestine, Syria, Asia Minor, Turkey, and Greece, and chiefly in the last-named country, but which, if differing in kind, do not differ in their light-brown or dust-coloured hue, as well as general appearance, from our common field grasshopper at home. Specimens of a stoutly-built species were found in the classic regions of the Acropolis, Pnyx, Stadium, Lycabettus, and Pass of Daphne. I have two small specimens of the larva of a Mantis, belonging, possibly, to the genus *Eremiaphila*, and bearing out its title in its natural habitat, as it was scarcely distinguishable in hue from the desert sand of Gebel Hashab, where I discovered it on the 22nd of March. Lastly, the mention of a remarkable-looking insect, *Callimenus oniscus*, must not be omitted. It is a wingless locust, that keeps up an incessant and shrill chirp in the underwood of myrtle and cistus, &c., on each side of the roads to Laurium and Marathon. As it hushes its strain when approached, it is not always easy to detect its presence, more particularly as its ground-colour is a bright apple-green, traversed by numerous horizontal bars of black across the body. This beautiful colouring, however, is turned to brown after its inevitable consignment to a wide-mouthed phial of spirits. It, no doubt, derives its specific name of *ὄνισκος*, "the little ass," in consequence of its similarity, from a dorsal point of view, to that beast of burden. There is great accuracy and scientific truth, be it

*Edipoda
germanica
(red
variety).*

*Acridium
tataricum.*

*Mantis
religiosa.*

*Callimenus
oniscus.*

Statement
in
Amos vii. 1
in reference
to grass-
hoppers
considered.

noted, in Amos vii. 1 : "Thus hath the Lord God showed unto me ; and, behold, he formed grasshoppers in the beginning of the shooting up of the latter growth ; and, lo, it was the latter growth after the king's mowings."

Several of the Orthoptera are not formed—in other words, do not receive their full development of wings—till late on in the autumn ; nor, as far as my own observation and that of a relative go, are the grasshoppers any earlier in Corsica and the South of Europe in this respect than our English ones, although they continue on the shores of the Mediterranean much later, where I have noticed them through November, and even up to Christmas ; whereas they disappear from our fields at home in or about the middle of September.

The difference between the English Orthoptera on the one hand, and those from the South of Europe and the East on the other, is that the latter are more numerous in species, and in individual number, and also in many instances larger in size. Single specimens of locusts are very rare and occasional visitors here, thus furnishing, even when they do occur, a marked distinction to the hordes which commit such widespread and utter devastation in South Russia, Cyprus, and elsewhere in the East.

Only a few
species of
Neuroptera
noticed in
the East.

Description
of them.

Libellula
depressa.
Calepteryx
virgo.

1. *Libellula striolata*
Sympetrum striolatum.
2. *Crocotthemis erythraea*.

Neuroptera, understanding by this term all species belonging to the tribe, according to the Linnæan application, are only scantily represented, as a rule, so far as my own observation goes, in the regions of the East. For example, in my tour of 1882, I only came across four species of dragon-flies, and three of these were common English ones, two of them, viz., *Libellula depressa* and *Calepteryx virgo*, skimming around the luxuriant vegetation on the banks of the River Meles (a short distance above the grotto of its Nymph, and where she is reported, according to popular tradition, to have nursed the poet Homer), on May 8. The same two species were also noticed at a later date, namely, May 25, about the wooded and stream-fed lawns adjoining the great bend or reservoir of Sultan Selim, in the vicinity of the village and forest of Belgrade ; while the third and commonest kind was *Sympetrum striolatum*, likewise seen at Belgrade, and so plentiful at home, more especially on heath or common in the autumn. The fourth one, also occurring at Belgrade, was *Crocotthemis erythraea*, of the same shape and size as *L. striolata* (otherwise called *Sympetrum striolatum*), but clearly to be distinguished by its bright red body from the tawny colour of the latter. During my second expedition, I have also only the occurrence of four species to report in the months of November and December, 1883, as follows:—

Libellula striolata, *Trithemis rubrinervis*, and *Crocothemis erythræa*, and all at Villa Ciccolani, public gardens, and Island of Roda, Cairo and Matareeyeh gardens, Heliopolis. *Trithemis rubrinervis* is not so common as the other two species, and, though nearly of the same size and form, has its body, if anything, more tapering in shape, is a singularly handsome kind, crimson or magenta coloured, with a blue-purple stripe down each side. I first saw it on the Island of Roda, and afterwards in the gardens of the Villa Ciccolani, as good localities as any I know of in Egypt for the capture of Neuroptera. The fourth, I regret to say, I was unable to obtain, and am, therefore, ignorant of its name. It usually flew very rapidly and high overhead, backwards and forwards, while I was forcing my way through the tall flags and thick underwood which fringes a portion of the Island of Roda, for the chance of a cast of the net. The colour of the body was lavender-blue, like that of the male of *L. depressa*, but in size it exceeded *Ceschna grandis* or *Anax imperator*, and was the largest species of any Neuroptera that I have ever seen alive. My visit to Athens and its neighbourhood in the latter end of May and beginning of June, 1882, must also be mentioned, as I then captured two species of Neuroptera, differing from Dragon-flies, being either the perfect insects of the Ant lion, or else allied to these last. The smaller, and by far the commoner of the two, had brown spotted and gauzy forewings, and the hinder wings much elongated, and very slender, in the shape of tails. It abounded everywhere, in the Pass of Daphne, the Stadium, Mount Lycabettus, &c., and was especially plentiful on the hill of the Acropolis, in the immediate vicinity of the Parthenon. Its name is *Nemoptera coa*. *Palpares libelluloides* is a rarer and much larger insect. I captured it in the Pass of Daphne, and on the hillside near the Throne of Xerxes. Its name, *Libelluloides*, is, of course, to be attributed to the fact that in the wide spread of its wings and brown spots upon them, it resembles some of the *Libellulidæ*—*Libellula quadrimaculata* in particular. I obtained a single specimen of a third kind—viz., *Myrmeleon sævus*—in the vicinity of Belgrade. This last bears a superficial resemblance to the genus *Agrion*. All these perfect insects of the Ant lion, or those species akin to them, have a slow, feeble, and wavering flight. The rare occurrence of brooks and streams, and likewise the fact that so few of the winter torrents are perennial in their flow, may possibly serve to account, to some extent, for the paucity of species of Neuroptera so noticeable in the East.

3. *Trithemis rubrinervis*.

Nemoptera coa.

Palpares libelluloides.

Myrmeleon sævus.

Enumeration of Oriental Hymenoptera. *Xylocopa violacea*. *Vespa crabro* and *Vespa orientalis*.

Among Hymenoptera may be mentioned a well-known Continental species, *Xylocopa violacea*, being a bee of large size, body and wings alike almost black, with a tinge of violet, from the Pass of Daphne, in May, 1882, and two kinds of hornet—the one our own *Vespa crabro*, from the tombs of the Maccabees, Latroon, in March, and also occurring at Ephesus, Philadelphia, and the River Meles, in the month of May, 1882; the other is *Vespa orientalis*, resembling our English one in colour and markings, but more elegant in shape. This last one was swarming in December, 1883, in and about Cairo and Heliopolis, being more particularly abundant at the confectioners' and bakers' booths, on the high, mud-built walls in the vicinity of the Boulak Museum and the Ostrich Farm, and likewise found at Helwân, Lycopolis, and on the roof of the Temple of Isis at Denderah. In this last-named place several of them were clustered on patches of clay containing cells, and which are the work of a small rust-coloured bee, *Chalicodoma Sicula*. Some of these hornets, being disturbed at our approach, began to fly about wildly, thereby rendering one's walk along the roof, at a height of, say, thirty feet from the ground without, and possibly twenty from the space within, the Temple, with no breastwork or parapet on either side, not over comfortable. *Vespa crabro* and *Vespa orientalis* might readily be taken for one another when not seen side by side.

Chalicodoma Sicula.

With regard to the above-named bee, *Chalicodoma Sicula*, of which there are specimens from Sicily and Algiers in the National collection, the amount and extent of its labour is truly wonderful. On reference to my *Nine Hundred Miles Up the Nile*, p. 137, I find the following paragraph about the same species at the Temple of Denderah:—"Hymenoptera are as busy here with their clay cells as elsewhere. They have plastered not only the hieroglyphics, but one whole side of the exterior of the temple, as well as the outer wall of the little chapel of Isis, on the roof." Again, with regard to the celebrated obelisk of Heliopolis, pp. 83 and 84 of the same work:—"The hieroglyphics, which are similar, or nearly so, on all four sides of the monument, include the hawk, the goose, the serpent, the ibis, and the head of the greyhound, and have been interpreted to mean as follows:—

The Hor of the Sun
The life for those who are born
The King of the upper and lower land
Khepher-ka-ra
The Lord of the Double Crown

The life for those who are born
 The son of the sun-god, Ra
 Osirtasen
 The friend of the spirits of An
 Ever living
 The golden Hor
 The life for those who are born
 Khepher-ka-ra
 Has executed this work
 In the beginning of the 30 years' cycle
 He, the dispenser of life, for evermore.

The figures of these animals on the east and west sides of the monument stand out in sharp and clear relief from the granite in which they are incised, being filled up with a coating of clay cells. The north and south sides of the obelisk are completely covered by it, so that the insect architect has rendered nearly all of the ancient carving, as well as the granite itself, invisible." Once more, in reference to Lycopolis, p. 130 of the same work: "Nor must the wonderful labours of hymenopterous insects be left unnoticed that have selected the western side of the cliff, as doubtless the most [sheltered, for their abode, and completely covered it in one particular spot with masses of clay cells."

Chrysis nobilis is a small bee, with blue metallic body, very much like a bluebottle in size and general appearance, frequenting the flowering shrubs in the public gardens of Cairo, in those of the Palace of Gezeedeh, and the mimosas bordering the fields in the neighbourhood of Minieh. On referring to my cabinet, I find that one specimen is named *Stilbum amethystinum*, and it is possible that, on closer examination, I may discover that I have both kinds, as this last-named and *Chrysis nobilis* are nearly-allied species, and of similar appearance. Among the wasps may be noticed two black-bodied species—*Eumenes hottentotta*, from Cairo; and the larger *E. tinctor*, from a field to the south of Minieh, both caught in the month of December, 1883. I have a third species (probably a *Eumenes* also) from the banks of the Pharpar, in April, 1882. Lastly, I have a small portion of a tree-wasp's nest that I found on a shrub alongside the high road between Mersina and Tarsus, on the 29th of April. Judging from the size of the cells, it can only have been constructed by a small species.

The following table will serve to some extent to show

Geographical distribution of Hymenoptera above mentioned.

the geographical distribution of the Hymenoptera above mentioned:—

Eumenes —Pharpar	}	Eastern species
Eumenes Hottentotta, Cairo		
Eumenes Tinctor Minieh		
Vespa crabro	}	English species
(Tomb of Maccabees, Latroon)		
(Ephesus)		
(Philadelphia)		
(Meles)		
Vespa orientalis ...	}	Eastern species
(Cairo)		
(Helwán)		
(Heliopolis)		
(Denderah)		
Chalicodoma sicula	}	Mediterranean littoral, found in Sicily and Algiers
(Heliopolis)		
(Denderah)		
(Lycopolis)		
Chrysis nobilis	}	Eastern species, probably
(Cairo)		
(Minieh)		
Xylocopa violacea	}	Continental species, generally distributed
(Pass of)		
(Daphne)		

Eastern ants.

Mention of Eastern Hymenoptera is, of course, not complete without a reference to ants, and I have been specially asked to say something about the corn-storing ants of Palestine, that have generally been supposed to lay up provisions against the winter. Though, if this be a fact, it does not necessarily follow from Proverbs vi. 8, "Provideth her meat in the summer, and gathereth her food in the harvest." Nor yet from Proverbs xxx. 25: "The ants are a people not strong, yet they prepare their meat in the summer." All that I know or saw about ants in the East may be very briefly stated. There is a large black kind, about the size of our black and red wood ant, that I noticed both in Egypt and Syria,—namely, in the public gardens at Cairo, in the desert of Jebel Ahmah behind the citadel at Cairo, and in the plain of Judeidah, and not far from the village of that name, during my drive from Damascus to the scene of St. Paul's conversion. It carries its head and tail alike cocked up aloft, and runs backwards and forwards, bearing a fanciful resemblance to an open carriage which is hooded at the back, and with shafts turned up, when pushed hither and thither in the process of being washed. There is also a much smaller species, likewise black, of which I captured a couple of specimens, on my second visit to Cairo in December, 1883, near the tomb of the Khedive's family on the edge of the desert. These two ants, when confined in a bottle, used to meet and push one another with their jaws

interlaced; but I could not observe that any injury was inflicted, although the contest ended in the larger one trotting round the bottom of the bottle with the other in its mouth. The only other fact that it occurs to me to mention with regard to the ant tribe is, that I obtained a species of *Mutilla*, ^{Genus} *Mutilla*. or winged ant (thorax rust-coloured, body black, with pale yellow spots), from the banks of the Pharpar, on April, 1882, where it had settled, if I remember rightly, on a flower.

I note that the Rev. J. G. Wood makes the following statement in *Bible Animals*: "In Palestine ants abound, and the species are tolerably numerous. Among them are found some species which do convey seeds into their subterranean home; and if their stores should be wetted by the heavy rains which sometimes prevail in that country, bring them to the outer air, as soon as the weather clears up, and dry them in the sun." Any one who wishes to test the truth of his words, can easily do so by watching the first ant's nest which he finds, the species of the ant not being of much consequence.

The same writer, however, proceeds to devote two pages and a half to the most wonderful ant in the world, *Atta* ^{Atta} *malefaciens*. of Texas, and other parts of America, and adds: "The economical habits of this wonderful insect far surpass anything that Solomon has written of the ant."

One of the ants of Palestine, of which a representation is given on page 621 of *Bible Animals*, belongs to the same genus as this marvellous agricultural ant, and is named *Atta* ^{Atta} *barbara*. From its appearance in the engraving, I judge it to be the same as the species I mentioned as having observed at Cairo and on the plain of Judeidah; but have never seen it in Palestine myself. Of *Diptera*, I secured five species—two ^{Diptera} from the neighbourhood of Athens (one, *Dasypogon punctatus*, on the hill of Colonos, on June 9; and the other, another kind of *Dasypogon*, from the Stadium, at the end of May); the third and fourth are, respectively, a species of *Tabanus*, or horse-fly, from the plain of the Litany, in April, and *Laphria atra*, Ephesus, in May; the fifth, likewise from Ephesus, is as yet unnamed.

Of *Hemiptera* I collected eight species, of which the five that ^{Hemiptera} I succeeded in naming, and two of the unnamed also, are all red, or reddish, with black patterns on their wing-cases:—1. *Lygæus militaris*, widely distributed, as collected at Aceldama and the Valley of Jehoshaphat, Mount Pagus, the Pnyx, the Acropolis, and Decelia. 2. *Strachia picta*, from the Stadium, and Throne of Xerxes. 3. *Pyrrhocoris Ægyptius*, from flowers close to Sardis railway-station, and also from Mount Pagus. 4. *Odontoscelis fuliginosis*, also from Sardis. 5. A

species of *Rhaphigaster* from Ephesus. 6 and 7 were collected on the summit of Boulgourloo; and 8 is one of the Homoptera. *Hydrometridæ* from Beyrout. Homoptera are solely represented by one kind—*Triecphora sanguinolenta*, from Aceldama, in April; Ephesus, in May.

The CHAIRMAN (T. Chaplin, Esq., M.D.).—I am sure we are all very much indebted to Dr. Walker for his most interesting paper, and after the Honorary Secretary has read the communications that have been received, we shall be glad if any of those present are disposed to add to the information so ably given in this paper.

Captain FRANCIS PETRIE, F.G.S. (Honorary Secretary), then read the following communications:—

From Mr. Sydney T. Klein, F.L.S., F.R.A.S., F.E.S. :—

“Clarence Lodge, Willesden, N.W., March 6, 1887.

“Many thanks for your kindness in sending a proof of Dr. Walker's paper, and an invitation to attend the Meeting to-morrow. I had fully intended being present, but regret to say that illness prevents me. I consider the paper of interest to all British entomologists, and of considerable value to the science generally, through the numerous records of captures of the same species in localities so widely differing both in respect to climate and geographical position.

“On page 119, Dr. Walker mentions that he found very few moths. This must be put down, I think, entirely to his not hunting them at night, the only time possible for catching nine-tenths of the Lepidoptera Heterocera; a light at an open window of his hotel, or a few strips of calico steeped in sugar and rum hung out of the window, would have brought them in hundreds if they were there at all. It is, however, a curious fact that there is very little information respecting moths to be found in the diaries of travellers in the East, whereas everybody has noted the existence of butterflies. I once passed a night among the ruins of Ephesus, and was surprised, as everybody must be who has been out at night in the East, at the superabundance of insect life, manifested by the continued roar caused by millions of chirps, scrapings, rattles, hummings, and cries from the country round. I have only heard such a din in the woods of Central America.”

From Mr. Hastings C. Dent, F.L.S. :—

“80, St. Stephen's Green, Dublin, March 5.

“The paper by the Rev. F. A. Walker on Oriental Entomology is of considerable value. Such synthetical observation is very important. I regret that I know nothing personally of those littoral regions of the Eastern Mediterranean, and am away from all my collections, books, and papers, so fear I can give no remarks that will be useful in the discussion.

“Page 113. The protective colouring of the Grayling (*Satyrus Semele*) is one among thousands of such instances which, though not visible in cabinets, is seen in the field. In my book, *A Year in Brazil*, you will find under this heading how the colouring is varied with the position of the insect at rest, *i.e.*, when resting with closed wings, the protective colouring is on the under side, when with expanded wings, on the upper side.

“P. 114. The Danaidæ are indeed very conspicuous, generally distributed, and often abundant. In the Hawaiian Islands I noticed one of these among

the only four species of butterflies I observed there (the others were, one *Lycæna*, and two *Vanessæ*).

"P. 115. Though far be it from me to say a word against the well-known Mr. Butler, he is strong in elaborating species—often, I think, needlessly; so that the species of *Ypthima* observed need not necessarily be new, especially as Dr. Walker had collected several specimens.

"P. 116. May I venture to remark that the suggestion in the second paragraph, as to visiting those six localities in successive years, is scarcely plain. Owing to the great difference in number of species and specimens observable in different years, it would not lead to fair comparison, e.g., for one person to visit, say Egypt in May one year, and Greece in May the next year. The only way would be for a series of collectors to visit all those places in the proper seasons in the same year, and this should be continued over a series of years, and the results tabulated.

"P. 125. The remarks on Dragon-flies are very interesting. They are one of the most ancient and most widely distributed of insects. In the Hawaiian Islands (where owing to the 2,000 miles which separate them from America, a great obstacle is presented to the migration of fauna of all kinds) these Neuroptera form the most important feature of its insects, and those islands have many species peculiar.

"P. 128. The black ants near Damascus, carrying head and tail aloft, are no doubt similar to a very beautiful species I observed in December last at Port Darwin, Northern Territory of Australia, only, that species was light brown and green. Its nest was formed of leaves of shrubs spun together *in situ*.

"P. 133. The genus *Mutilla* of ants is very interesting to me, chiefly owing to its being mimicked in Brazil by a Coleopteron.

"P. 129. I have given lengthy notes in my book, *A Year in Brazil*, on the economic habits of the species of *Atta* named *Cephalotes* and *Abdominalis*.

"I am so pressed for time that I must crave forgiveness for this very hasty line, but I hope you may deem it of sufficient interest to show to Dr. Walker, and present to him my best thanks for bringing before our Society so valuable a record of his observations. The only fault I can find is that there are no loop-holes for discussion here, and not much opportunity for debate. I should have liked some theories advanced, as to causes of differentiation, typical forms, etc."

From the Rev. A. Fuller, F.E.S. :—

" Pallant, Chichester, March 5.

" Allow me to thank the Council of the Victoria Institute through you for their invitation to be present on Monday evening to hear Dr. Walker's paper. Had I been in London I should certainly have tried to avail myself of it. I have read over the proof of the paper kindly forwarded with much interest, as it is by such detailed communications the range of species can alone be arrived at. Never having been in the East myself, I fear any comment of mine would be rather beside the question, otherwise I might add a note or two to the Swiss localities mentioned by Dr. Walker, for instance :—

"P. 111. *Aporia Cratægi*. Two on hill-side, first week, August, 1882, Pontresina.

"P. 113. *Melitæa Didyma*. Same time and place, moderately common.

"*Argynnis Lathonia*.* Four very fresh specimens. Same time and place, moderately common.

* On referring to one of my cabinets I find a specimen of *Argynnis Lathonia* labelled Pontresina, Sept. 16, 1872. I distinctly remember catching it beneath the Roseg Hotel, a little way down the road that leads to the Roseg glacier.—F. A. W.

"P. 112. Of the cosmopolitan character of *Vanessa Cardui* I might add that when in Canada two years back, I traced and captured it frequently, the whole distance from Quebec to Calgary, within forty miles or so of the Rocky Mountains.

"P. 116. The original English specimen of *Lycæna Bætica* is now in my possession, and the date of capture is marked on it, 12th August, 1859. I only name this as regards date in comparison with 10th December, when Dr. Walker caught it at Cairo."

The Rev. T. W. Fowler, F.L.S., observes, with reference to p. 129, l. 6, that "Mutilla is not an ant, although often thus designated." He adds:—

"P. 120, l. 7, etc. The best way to preserve insects is in sawdust and benzine with a little carbolic acid added, the insects and sawdust being packed in layers; spirit bottles are apt to get broken.

"P. 120, near bottom. As a matter of fact there is a great deal of connexion between the Coleoptera of the circum-Mediterranean region.

"P. 121, towards bottom. The genus *Oxythyrea* is much more widely spread than is here mentioned; species occur all over Africa as far south as the Cape of Good Hope; it does not, however, appear to be found in eastern Asia or in the New World."

Another Correspondent writes:—

"Kersal Cottage, Prestwich.

"I consider the Rev. F. A. Walker's paper of extreme interest, especially as giving a personal narrative, and reliable information of what actually came before his eyes. On the other hand, I hope it will not be considered hypercritical to suggest that the paper would have been rendered still more valuable, in my opinion, from a scientific point of view, had Dr. Standinger's catalogue of Macro-Lepidoptera of Europe and the East been consulted, and records of those species not personally observed, added. More than twenty-five of our British butterflies, for instance, doubtless occur in the list, as Dr. Walker (p. 109) observes, and the comparative tables of British and Eastern species would then have been rendered more perfect. As a record of personal observation, and considering the multitudinous difficulties and discomforts of pursuing any branch of natural science away from one's own country, Dr. Walker was indeed most painstaking and successful, and we cannot but congratulate him very heartily on the good results he obtained."

From Mr. A. H. Swinton, F.E.S., of Lansdown, Dane Park, Ramsgate, describing a visit to Burgos, says:—

"Near the castle-wall above the town I found a bank of dwarf elder and thistles skeletoned to tissue by the ravages of *Cynthia Cardui*, the Painted Lady butterfly. The caterpillars of the butterfly are still feeding, and yet the butterflies are hovering over the blossoms, whose pink tassels appear to be wired on the stalks. Nature teems in its birth. In our country the Tortoiseshells (*Vanessa Urticæ*) make similar capital out of the nettles. Can one longer marvel at the swarms of Belle Dames that periodically wing northward in long files?

"Tall poplar avenues at Burgos stretch out along the valley, and form cool walks and drives in the direction of the monasteries. Walking one day in their shadows, I disturbed a Large Tortoiseshell butterfly (*Vanessa Polyochlorus*), whose presence I ascribed to the existence of certain stout and sturdy elms, an Alameda being quite an unusual sight in the sunny corn. It is singular that the Earl of Sandwich should have stated to Evelyn, that before Philip II. transported these ornaments of our parks

to construct suburban walks and vistas, there were actually no elm-trees in Spain. I must, however, remark that there is an equally singular statement made by Hollingshed, to the effect that in Queen Elizabeth's time there were no asses in England, and that Spanish donkeys were then imported. Certain butterflies that appear to leap from the tree trunks to the earth and back again, are often noticed at the sunny leaf-strewn edges of these Castilian avenues. There are our own heath-frequenting Grayling and its congeners, *Hipparchia Briseis* and *Statalinus*. None of our commoner English butterflies, however, except the Meadow Browns, appear in excess in Castile. I noticed the Small Tortoiseshell on the nettles that fringe the old wall of Burgos, where a flame-coloured Cuckoo-Bee who was darting about had a perquisite of crannies, and near garden plots a few Cabbage Whites were flying.

REV. DR. WALKER.—I should like to say that I received a letter this morning from my friend, Mr. Frederick Pascoe, a well-known Fellow of the Linnæan Society, who pleads a previous engagement as the reason why he has been prevented from attending our Meeting this evening. I may add, with regard to the question of using spirits as a means of keeping beetles and other insects, that although I should not like it to be thought it does the insects any harm, Mr. Pascoe says they never do so well after they have been kept in spirits. I am under the impression that spirits injure beetles much less than they do grasshoppers, and that probably spirits are the only handy medium to which you can consign insects in the East to preserve them from decay. With regard to the great *Scarabæus*, Mr. Pascoe is inclined to keep up the old name, *Scarabæus*, and repudiates the designation "*Ateuchus sacer*," which I have given it in this paper.

THE CHAIRMAN.—As I happen to have had some experience of life in the East, and particularly in Palestine, there are one or two points that have come under my observation on which I may be permitted to offer a few remarks. One has reference to the interesting subject of ants. It is stated in the Book of Proverbs, that they are "exceeding wise," and "prepare their meat in the summer." Certain naturalists in Europe have for many years been in the habit of denying this statement, but within a recent period it has been clearly ascertained that it is actually true, and I am enabled to state from my own personal observation that there is no doubt whatever about it. In fact, it is one of the commonest things in country places in Palestine to see the ants busily engaged during the harvest season in carrying away corn, the seeds of grasses, and other things to their nests. They sometimes travel over great distances in order to do this, and nothing is more common than to see a long path, extending perhaps twenty, thirty, or forty yards, and more even than that, trodden down and worn quite bare by hundreds of thousands of ants passing to and fro upon it. They find out some place where wheat or barley, or some other grain, has fallen, or where there is a threshing-floor, and they start off in thousands to the spot, each ant carrying from it a seed of barley, wheat, grass, or whatever it may be. Another point of great interest in connexion with the proceedings of these little creatures is that it is said they are sometimes seen to bring out a store of provisions when it has been wet, in order

that the food may be dried in the sun. For my own part, I do not feel at all sure that this is so. It seems to me that what really does occur is this : when the harvest is over, and the ants have no chance of obtaining further supplies of grain, they set to work and dress the corn and seeds they have collected, taking off the husks, which they bring out and throw on the ground around their nests, so that one sees a great number of circular masses of chaff, which, if examined, are found to consist of the husks of corn and grass seeds. This is one of the instances we meet with, showing what very acute observers the writers of the Holy Scriptures were, and that there is no reason to doubt the statement of Agur in the Book of Proverbs, to which I have referred. Another question of great interest is that which is connected with another class of insects—the locusts. I have brought some of those insects here to-night, because it is not often that people in England can see them in what represents two different stages of their existence. (In the smaller bottle are some locusts quite young—probably not more than a week or two old—small, black creatures.) The locusts traverse Eastern countries in immense numbers, thousands of millions. I have seen them in a column nearly a yard broad and a mile long, and I have noticed that when they meet with any obstruction they will go on either side of it ; they do not run, but make progress by a series of jumps, and though the natives dig trenches for them, and throw earth over them in order to smother them, and sometimes pile them in great heaps and throw brushwood over them, and set fire to it, they are unable to exterminate them.* When growing they become of a yellow colour, and shed their skins. I have seen them hanging to the branches of the olive and other trees, and wriggling out of their skins, after which they grow to the size of the locusts shown in the larger bottle I have here, and it is when they have reached that stage that they do the enormous amount of damage we so frequently hear of. The account of the invasion of locusts given in the Book of Joel is accurate to the most minute particular. It is, indeed, a most wonderful description ; but there is one expression in it which I think is rather obscure to us in England. I refer to the passage :—“He hath barked my fig-tree the branches thereof are made white.” This, however, is exactly what the locusts do. They eat all the leaves off the fig-tree, and then eat the bark off the smaller branches where it is soft and succulent, and the ends are left standing out quite white, so as to give a weird appearance to the tree. They also clear the olive-tree, taking away every leaf, but not eating the bark. Another peculiarity they have is that they do not break their ranks. They stand together, perhaps eight or ten in a row, in one place, and eight or ten in another, just like cavalry, while the noise they make is said to be like that of running horses.

* In a small Blue-book just published, Mr. S. Brown, Government engineer, reporting on the locust campaign in Cyprus in 1885-86, states that the estimated number of egg-cases was 5,076,000,000 in 1883-84, while in 1885-86 the number was slightly over 249,000,000.—Ed.

In devouring the contents of a garden the noise they make is certainly very curious, and I never heard anything like it. It is a very terrible sound, because it means desolation. Each locust makes a little noise as it gnaws, and as that sound is multiplied by tens and hundreds of thousands, it produces a very singular impression. I remember one invasion of locusts, which will afford you an idea of the numbers in which they make their appearance. I had to travel a distance of some sixteen miles on horseback, and for the whole of that distance the locusts were like, snowflakes in the air, and my horse could not put his feet down without treading on them. I have thought it might be of interest to you to mention these things in connexion with what we read in the Biblical statements, because I feel from my long experience in the part of the world I have been speaking of, that the more we study the narratives in the Bible, and compare them with what is seen and recorded at the present day, the more clearly do we perceive how accurate was the observation of those who compiled the books of the Old Testament.

Mr. J. STALKARTT.—I can vouch for the singular sound produced by the locusts, as well as for the fact that when flights of those insects have once settled, the difficulty is to get them up again. I have been in the indigo districts, where they have eaten up everything on the plantations, and the difficulty of the planters is how, when a swarm appears, to keep them going so as to prevent their settling, all the fire-pans and brass instruments they have being beaten to keep the insects on the wing. They may be seen flying in the distance like a red cloud, and sometimes they go hither and sometimes thither, but, whatever else they devour, they do not like the tea-plant. They may settle in the scrub or jungle near, but they do not seem to care for the tea plantations,—I presume on account of the bitter or acrid matter in that plant. On all the other plants, as well as on the trees and grasses, they settle readily. From what we see in India as to the species of butterflies there, everything depends on the food furnished by the different districts. If in any part of the country certain plants or trees are destroyed, we do not find the butterflies that were originally there. Butterflies of particular species inhabit much the same kind of districts. There being no cabbages out there, you do not get the Cabbage Butterfly, and the same observation applies with regard to the moths. These bore into the trees, and if the trees are cut down, no more moths of the same kind are found in that district. Therefore, where there is a sameness in the grass or plants on which the caterpillars live in different parts of the world; we may expect to find the same species of butterflies. I have no doubt that Dr. Walker would derive a great deal of pleasure from a visit to some parts of India, where we have the most beautiful butterflies. In the neighbourhood of Darjeeling he might make a splendid collection of butterflies and beetles. With regard to what has been said as to swarms of moths, I may add that in India we had swarms of beetles. They fly at night, and settle on the trees, the leaves of which they eat up in a single evening. When they lay their eggs, the grubs are a great detriment to the cultivation of the places in

which they are found. The beetles burrow in the ground, and the grubs they produce are white, and of different sizes, according to the size of the parent beetle. These grubs first of all eat the roots of the tea-plants, and then they attack the upper part. The only way in which we could get rid of them was by setting women and children to dig them up and collect them. They lift up the grass as one would raise a sheet or table-cloth, and underneath they find the grubs as thick together as plums in a plum-pudding.

The CHAIRMAN.—There is no doubt that the locusts prefer some plants to others ; and in all the invasions of these insects I have known, they have gone on in regular succession, although they have always eaten the vines last. They seemed to me to have great objection to these, probably because of the acid in the leaves. The locust-trees they never ate at all, but went away and left them untouched.

Rev. J. J. COXHEAD, M.A.—I think we ought to express our thanks to Dr. Walker for his able and interesting paper. He has handled his subject in such a way as to show how highly valuable are careful observations such as he has been able to make in Palestine and other parts of the East. What struck me most forcibly in the paper was that the commonest species of butterflies, such as those with which we in England, and Europe generally, are familiar, are more abundant in those parts of the world than any other particular species which is there met with.

Rev. Dr. WALKER.—Locusts, as far as I am aware, differ from all other insects in this respect, that they grow after they have reached the mature stage. It is a characteristic of other insects that, when no longer in the larva state, they do not increase in size ; but the locust increases from a very small size to a very large one after it has reached the perfect stage.

The Meeting was then adjourned.