suggesting closer relationships than can be affirmed with certainty to exist.

#### DESCRIPTION OF THE FIGURES.

Fig. 1. Internal surface of one half of the cone: enlarged two diameters.a. Part of the axis of the cone.

b, c. Carpellary scales.

b', c', the upper; b'', c'', the lower tissues of these scales.

d. The seeds in situ.

- e. The testa of the seed.
- f. The nucellar membrane of the seed.

g. The embryo-sac.

- h. The wing of the seed.
- Fig. 2. Transverse section of portions of two carpellary scales, enlarged six diameters, the lower bearing two ovules, as seen in a tangential section of the exterior of the cone. The reference letters as above.

i. Portion of a seed belonging to a collateral carpellary scale.

XIV. On the Hymenoptera of the Hawaiian Islands. By the Rev. T. BLACKBURN, B.A., and P. CAMERON.

Read before the Microscopical and Natural-History Section, January 18th, 1886.

THE investigation of the natural history of oceanic islands is now rightly regarded as a subject of great interest and importance. Not only do their fauna and flora throw much light on the manner in which species have been distributed over the globe, but many of the species themselves are, from the peculiarities of their structure, of extreme value in throwing light on the origin of species. The natural history of oceanic islands ought, furthermore, to be seriously investigated without delay; for there is not the slightest doubt that the introduction

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of cultivated plants, and the changes caused in the ground by their cultivation, as well as the introduction of Old-World weeds and insects, must, before long, lead to the extermination of many of the native species. This is the more likely to be the case from many of them being of extreme rarity. In fact, according to Mr. Blackburn, one of the most remarkable features in connection with the insects of the Hawaiian Islands is "the extreme rarity of specimens in comparison of the number of species, the common insects being very few indeed, and the rather common ones almost none at all"\*. We know that many of the animals of oceanic islands have become extinct within comparatively recent times; and in my mind there is not the slightest doubt that many more will be driven out of existence within the next generation or two. Every endeavour, therefore, ought to be made to induce residents in these remote islands to collect and preserve their insect inhabitants. That good results would be obtained from their doing so can be proved by the remarkable discoveries made by the late Mr. Wollaston in St. Helena, and by Mr. Blackburn in the Hawaiian Archipelago, discoveries of the greatest morphological and biological importance.

In all countries where the Coleoptera and Hymenoptera have been equally studied, it is found that the latter in numbers equal, if they do not surpass the former. Mr. Blackburn collected in the islands 428 species of beetles, whereof 352 species are at present only known from the Archipelago. As there is not one fourth of this number known of Hawaiian Hymenoptera, I think we may conclude that very many more species have yet to be discovered, even although it may ultimately be proved that they are scarcer relatively than the beetles.

\* Scient. Trans. of the Roy. Dubl. Soc. iii. p. 202.

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Dr. Sharp\* divides the coleopterous fauna of the islands into three divisions: first species (chiefly cosmopolitan) introduced in stores, ballast, &c., by commerce; secondly species introduced by natural currents in drift-wood, &c.; and thirdly endemic or autochthonous species, the latter being distinguished from the second by structural peculiarities, being to all appearance forms of great antiquity, the distinction between the two groups being owing, no doubt, to the fact that the autochthonous species were introduced into the islands at a much more remote period —so remote, indeed, that their nearest allies have become extinct, or nearly so, on continents, where the struggle for existence has been much keener.

My knowledge of the Hymenoptera is not sufficient to enable me to separate the species which belong to Dr. Sharp's two last categories; yet I have no doubt at all that most of the species of *Crabro*, *Odynerus*, and *Prosopis* have originated in the islands by evolution from one or two species introduced at some remote period into the islands by currents on drift-wood. The aculeate species found in the Archipelago belong to genera which we might  $\hat{a}$  priori expect to find there, being species which form their nests in or on wood, the genera which nidificate in the ground being absent.

The following species have, I believe, been introduced by man's agency :— Camponotus sexguttatus, Ponera contracta, Monomorium specularis, Tetramorium guineense, Prenolepis longicornis, Pheidole megacephala, Solenopsis geminata, all ants of wide range. Pelopæus cæmentarius, Polistes aurifer, P. hebræus, Xylocopa æneipennis, Evania lævigata, Metacælus femoralis, and Spalangia hirta.

It is possible that *P. hebræus* may belong to Sharp's second group, but I have no doubt that *P. aurifer* and the

\* Scient. Trans. of the Roy. Dubl. Soc. iii. p. 269.

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Xylocopa have been introduced in timber from America. Metacælus and Spalangia are parasites on the house-fly. Neither of them is, I believe, common in Europe; nor am I aware if they inhabit America. A species of Spalangia has been found in the Galapagos Archipelago.

The genera Prosopis, Megachile, Odynerus, Leptogenys, Pimpla, Ophion, Limneria, Chelonus, Epitranus, Chalcis, Eupelmus, and Evania have a wide range over the earth. The genus *Echthromorpha* is, so far as we know, confined to oceanic islands, the five known species being from the Hawaiian Islands, St. Helena, Ascension, and Tahiti, Society Isles, in which latter island a new species has recently been discovered by Mr. J. J. Walker, R.N. The genera Sierola, Moranila, and Solindenia are only known from the Archipelago, but our knowledge of the Chalcididæ is not sufficient to enable me to say anything very definite about the affinities of the island species. Sierola and Scleroderma belong to a group of much interest, being one which is intermediate between the Terebrant and Aculeate sections of Hymenoptera. A species of Scleroderma, it may be noted, is found in St. Helena.

Smith offers the opinion that the Hymenoptera are most nearly related to the American fauna. On this point I am not prepared to offer an opinion at present; and I rather think that Smith formed his conclusion on the occurrence of *Xylocopa æneipennis*, *Polistes aurifer*, &c., which have been introduced, as I believe, by man's agency, and consequently must not be taken into account in judging of the affinities of the endemic species.

The following is the literature relating to the Hymenoptera of the Archipelago :----

Fabricius, Ent. Syst. ii. p. 269 (Odynerus radula).

F. Smith, Cat. of Hymen. Ins. i. p. 23 (Prosopis flavipes and P. anthracina).

- F. Smith, l. c. iv. p. 421 (Crabro unicolor and C. distinctus and Mimesa antennata).
- Holmgren, Eugenies Resa, Zool. vi. pp. 406 & 441 (Echthromorpha maculipennis and Rhynchium nigripenne = Odynerus maurus, Smith).
- F. Smith, "Descriptions of New Species of Aculeate Hymenoptera collected by the Rev. Thomas Blackburn in the Sandwich Islands," Proc. Linn. Soc. xiv. pp. 674-685; also described in his 'Description of New Species of Hymenoptera,' 1879.
- Thomas Blackburn and W. F. Kirby, "Notes on Species of Aculeate Hymenoptera occurring in the Hawaiian Islands," Ent. Month. Mag. xvii. pp. 85-89.
- P. Cameron, "Notes on Hymenoptera, with Descriptions of New Species," Trans. Ent. Soc. 1881, pp. 555-562 (Sierola (g. nov.) testaceipes, Chelonus carinatus, Monolexis? palliatus, Chalcis polynesialis, Crabro polynesialis).
- P. Cameron, "Descriptions of New Genera and Species of Hymenoptera," Trans. Ent. Soc. 1883, pp. 187–193 (Epitranus lacteipennis, Moranila testaceipes, Solindenia picticornis, Eupelmus flavipes, Evania sericea, Limneria polynesialis, L. Blackburni, Ophion lineatus, O. nigricans).

The descriptions of new species of *Prosopis*, Odynerus, and Crabro, and the remarks thereon are by Mr. Blackburn. All that I have done in these genera is to catalogue and bring together the references to the species; also I have made certain alterations in synonymy. I have likewise to thank Mr. G. F. Matthews, R.N., for some specimens from the islands.—*P. C.* 

As I have in my collection of Hawaiian Hymenoptera a considerable number of undescribed species, and made various observations of habits &c., at periods subsequent to the description by Messrs. F. Smith, W. F. Kirby, and P. Cameron, of certain new species, I think that it will be desirable for me to put forth a paper on these insects in which I shall endeavour to include the hitherto undescribed species, and add such remarks as may seem profitable concerning those that have already been described.

The Hymenopterous fauna of the Hawaiian Archipelago is, I believe, a rich one. It held a claim on my entomological energies so decidedly second to that of the

Coleoptera, that I think the fact of its being represented in my collection by considerably more than a hundred species, to be very conclusive on the point, that a specialist studying the group would reap a great harvest were he to visit the locality.

I have published (in the Scientific Trans. of the Royal Dublin Soc. 1884, pp. 87 et seq.) some general remarks on the climate &c. of the Hawaiian Islands in their relation to the insect-fauna, to which I will venture to refer for the generalities that might perhaps be looked for as an introduction to such a paper as the present, merely adding that (so far as I can judge) Maui is not, in respect of this group of insects, so clearly the metropolis of the islands as it is in respect of other groups. It has produced (as will appear from what follows) one or two of the most striking and specialized types, it is true; but, nevertheless, I am inclined to think that it must yield to Hawaii the claim to be the Hymenopterous centre, as that island has yielded the most numerous and most strongly-marked forms in every family but two, viz. Apidæ and Sphegidæ. The species (Prosopis rugiventris, mihi) of the former, on which this remark is founded, very probably is confined to Maui (and the closely adjacent island Lanai), while the occurrence there, either solely or in much greater numbers than elsewhere, of P. Blackburni, Sm., and P. hilaris, Sm. (two of the most striking species of the genus), confirms the probability that Maui really is peculiarly rich in these insects. The occurrence in very small numbers of Mimesa antennata, Smith, of which no close ally has occurred in other localities, may possibly be due merely to insufficient observation on my part, and, therefore, will not count for much; while, on the other hand, the fact that the Vespidæ and Crabronidæ of Hawaii are so much more striking in appearance and specialized in structure than those of any

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other island is, I feel no doubt whatever, due genuinely to the Hymenopterous wealth of the island.

## ANTHOPHILA.

#### ANDRENIDÆ.

In this family the indigenous species are not improbably confined to the genera Megachile and Prosopis. Apis *mellifica*, Linn., is of course introduced, and it can hardly be thought likely that Xylocopa aneipennis, De Geer, is a true native of the islands. It may fairly be questioned whether the destructiveness of the latter does not more than counterbalance the profitableness of the former. The habits of the single Hawaiian species of Megachile noticed by me have been fully reported by Mr. F. Smith. The descriptions &c. of the species of Prosopis found on the Archipelago are so scattered, and contain so many slight inaccuracies, that I think it might be well for me to review them seriatim, adding descriptions of certain additional species, and furnishing a Table of their distinctive characters, as follows :---

## I. Prosopis fuscipennis.

Prosopis fuscipennis, Smith, Proc. Linn. Soc. xiv. p. 682; Kirby, Ent. Month. Mag. xvii. p. 85.

I have nothing to add to the excellent description of this species in Mr. F. Smith's two papers. I have never taken it elsewhere than on Oahu, and there only rarely.

## 2. Prosopis satellus, sp. n.

Niger; confertim punctatus; clypeo (antice rotundato), antennarum articuli basalis fronte, tarsis tibiarumque anticarum fronte, testaceis, antennarum articulo basali valde compresso; alis fuscis.

Long. 11 millim.

This species is allied to P. fuscipennis, Sm., from which it differs as follows :- The clypeus is yellow, the anterior margin of the thorax is not testaceous, the tegulæ are paler, the punctuation throughout is finer and closer (especially so on the metathorax, which is a little rugose only in front and on the hind body). The basal joint of the antennæ is much more strongly compressed, being on its flat face as wide as long, and has its front side more strongly rounded than the hinder side.

I have seen only a single male of this insect, which occurred in September on Haleakala, Maui, at an elevation of about 5000 feet.

### 3. Prosopis Blackburni.

## Prosopis Blackburni, Smith, Proc. Linn. Soc. xiv. p. 682; Kirby, Ent. Month. Mag. xvii. p. 85.

The original description of this insect was founded, I believe, on a single individual of each sex, the male being an unusually brightly coloured one. At a subsequent period I met with the species plentifully, and the examination of something like a hundred specimens has satisfied me that it is subject to much variation. I think therefore that it will be well to supplement the description with a further one, somewhat more in detail. The distinctive characters seem to be as follows :---Head unusually elongate in both sexes, the width across and including the eyes being scarcely equal to the total length. The clypeus is abruptly truncate or even gently concave at the apex. In the male the whole space below the antennæ is yellow, and this colour is produced in a triangular form between the base of the antennæ, and also runs back as a gradually narrowing vitta adjacent to the eyes on either side of the head. The extent of this colouring is subject to occasional variety; I have a specimen in

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which the small plate between the clypeus and the antennæ is black, and several specimens in which the lateral yellow vittæ are abbreviated, but none in which the yellow colouring is confined to the space in front of the antennæ. The least brightly coloured specimens, moreover, differ from P. facilis, Sm., in having the entire space between the eyes and the clypeus yellow. The scape of the antennæ is not much dilated in the male, being more than twice as long as wide, and moderately arched; it is generally black, and rarely displays the yellow line mentioned in the original description. In both sexes the flagellum is yellow (or at least ferruginous) beneath; in some instances the whole flagellum, and even the scape, is red, the underside of the former being then of a vivid yellow. The colouring of the legs varies, even in the male, from that described by Mr. Smith, to an almost uniform pitchy colour, save that the front of the front tibiæ is always pale, and the tarsi are seldom obscured. The wings have scarcely any trace of fuscous colouring in the male and not much in the female. The size of the male varies from 7-10 millim. long, that of the female from 8-11 millim. long. I have this species from Maui, Lanaii, and Hawaii. Specimens from Hawaii seem to be, as a rule, more obscurely coloured than those from other localities. The brightly coloured type occurs on Maui, near the sea-coast.

### 4. Prosopis facilis.

Prosopis facilis, Smith, Proc. Linn. Soc. xiv. p. 683; Kirby, Ent. Month. Mag. xvii. p. 85.

Of this insect I have examined about 50 examples. It is not very close to any other of the genus, nor does it vary much. The original description is a good one, but may advantageously be amplified a little. *P. Blackburni*, Sm., is, I think, its nearest ally. The head is moderately

elongate, but decidedly less so than in P. Blackburni, the width from eye to eye in front of the base of the antennæ being about the same as the length from the base of the antennæ to the apex of the clypeus. The apex of the clypeus is rounded. There is a very distinct elongate depression on either side of the head close to the eyes. The clypeus and the plate between it and the antennæ are yellow in the male, as also is a narrow space on either side of the clypeus, but the yellow colouring extends laterally to the eyes only in the extreme front, and does not extend at all behind the antennæ, so that the head even in front of the antennæ is only partially yellow. The antennæ are uniformly of a blackish colour, the basal joint being not much dilated but very strongly arched in the male. The punctuation does not differ much from that of P. Blackburni, the upper surface of the hind body showing no distinct punctures. The legs are of a blackish colour, except the front tibiæ and tarsi of the male, which are more or less testaceous in front. The size of the male varies from  $6\frac{1}{2}$ -10 millim. long, that of the female from 7-101 millim. long.

The original types of *P. facilis*, Sm., were from the Pauoa Valley, Oahu (not from Maui as stated by Mr. Smith). The insect, however, occurs on Maui and also on Hawaii.

The only colour vars. I possess of the male have the plate between the clypeus and the antennæ black.

## 5. Prosopis flavifrons.

Prosopis flavifrons, Kirby, Ent. Month. Mag. xvii. p. 85 (8).

Allied (but not very closely I think) to *P. Blackburni*, Sm., and *P. facilis*, Sm. This insect may be readily identified by the following characters :—The yellow mark on the face occupies the whole space in front of the antennæ,

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but does not extend behind them. The clypeus is rounded in front. The basal joint of the antennæ is extremely compressed, being, on the flat face, scarcely longer than wide, and of subcordiform shape; the anterior margin of this joint is narrowly testaceous. Near its apex the flagellum is testaceous beneath, while the legs are of an obscure colour except the front tibiæ, which are testaceous in front. The head does not differ much in shape from that of *P. facilis*, Sm., nor is the punctuation of the insect much different. The length is about  $7\frac{1}{2}$  millim. I have found this species only on Kauai, and have not seen the female.

# 6. Prosopis Kona, sp. nov.

Niger, flavo-variegatus, haud crebre punctatus; capite minus elongato, clypeo antice rotundato; alis hyalinis.

3. Antennarum articulo basali fortiter compresso.

Long.  $\mathcal{J}$  5 millim.,  $\mathcal{Q}$  7 millim.

This is a very distinct species. In the male the face is coloured as in typical *P. Blackburni*. The anterior margin of the thorax and a spot under the tegulæ are yellow; the tibiæ are yellow with a black spot on the posterior face of the front pair, and a similar spot on each side of the others; the first joint of each tarsus is yellow, the remainder are fuscous; of the antennæ the lower surface of the flagellum is testaceous, and the basal joint is much compressed (considerably more so than in *P. Blackburni*), but the dilated face is quite evidently not so wide as long, and its sides are strongly rounded. The hinder portion of the head is closely and very finely punctured; the surface of the thorax is opaque with excessively minute punctuation, and has also some larger punctures (but even these are fine), the cavities of which, under a strong lens,

are shining; on the postscutellum the system of larger punctures seems to fail; the metathorax is more shining, and its sculpture seems to consist of a mixture of very fine granulation and some oblique wrinkles; the upper surface of the hind body is not very shining, and its sculpture consists of excessively minute punctuation invisible, except under a very strong lens; while the undersurface is similarly punctured with the addition of a system of much larger but very feeble shallow punctures.

The female (save in the usual respects) does not differ much from the male; it is larger, however, and the colouring of its head consists in a slender yellow line along the internal margin of the eyes.

I obtained three specimens of this little insect on the western slopes of Mauna Loa, Hawaii, at an elevation of about 6000 feet, in May.

## 7. Prosopis coniceps, sp. nov.

Niger, flavo-variegatus, punctatus; capite brevi pone antennas tumidulo; clypeo antice rotundato; alis hyalinis.

3. Antennarum articulo basali compresso, minus elongato. Long. 3  $6\frac{1}{2}$  millim.

In this species the markings on the head are peculiar, the anterior third of the clypeus is entirely yellow, the posterior quarter entirely black, the apical yellow being produced backwards in the middle of the intervening space as a broad band, while the basal black is narrowly produced forwards on either side of it; there is also a large yellow triangle on either side between the clypeus and the eye. The yellow colouring does not extend as far backwards on the head as to the base of the antennæ. The front side of the front tibiæ is yellow; the tarsi are tes-

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taceous at the base, becoming fuscous towards the apex; the rest of the insect is black. I find no very noticeable difference between this species and P. facilis, Sm., in respect of punctuation, except that the head is rather more roughly punctured behind the antennæ. The head is very short, the distance from eye to eye across the front of the base of the antennæ being very considerably greater than from the base of the antennæ to the base of the clypeus. The portion of the head behind the antennæ is tumid, so that the ocelli seem to be placed on a rounded swelling. The apex of the clypeus is rounded. The underside of the hind body is sparingly and not strongly punctured. The basal joint of the antennæ is rather strongly dilated in the male, its length being hardly twice its width.

A single specimen occurred on Mauna Kea, Hawaii, at an elevation of about 7000 feet, in February. A female taken in the same neighbourhood probably belongs to this species, as its head is similarly formed, though it is less roughly punctured. It is quite black, except the legs, which are dark pitchy, and the wings are much clouded with fuscous.

## 8. Prosopis rugiventris, sp. nov.

- Niger; obscure punctatus; antennarum flagello apicem versus ferrugineo; abdomine plus minusve rufescente; clypeo antice subtruncato.
- ♂. Fronte testacea; tibiis anticis dilutioribus; antennarum articulo basali fortiter compresso, vix quam latus longiore; abdominis segmentis ventralibus nitidis, inæqualibus.

Long.  $3^{5\frac{1}{2}}-8$  millim.,  $9^{7}$  millim.

The punctuation does not appear to differ much from that of *P. Blackburni*, Sm., which this insect resembles also by its scarcely less elongate head and the only slightly

rounded apex of the clypeus. In the male the face is entirely (or almost entirely) yellow in front of the antennæ, but the yellow colouring does not pass the antennæ backwards. The flagellum is testaceous on the underside, in some specimens entirely ferruginous. The front tibiæ of the male are testaceous in front. In both sexes the hind body is reddish (in some specimens quite red). The basal joint of the antennæ in the male is strongly compressed, its flat face being scarcely longer than broad. The hind body beneath is almost impunctate and very shining in the same sex, while across each segment runs a transverse, rounded, and sinuated ridge, more strongly developed in some specimens than in others.

I possess two specimens of this insect from Maui and five from Lanai. One of them (taken in company with the males) is a female, and closely resembles the female of *P. Blackburni*, Sm.

## 9. Prosopis hilaris.

Prosopis hilaris, Smith, Proc. Linn. Soc. xiv. p. 683; Kirby, Ent. Month. Mag. xvii. p. 85.

The male has been well described by Mr. Smith. The female closely resembles it, being, however, somewhat larger  $(9-9\frac{1}{2}$  millim. long). The colouring is precisely similar, save that bright yellow is replaced by obscure testaceous. The basal joint of the antennæ is, of course, not dilated, and the apical segments of the hind body present the usual sexual differences.

### 10. Prosopis volatilis.

Prosopis volatilis, Smith, Proc. Linn. Soc. xiv. p. 683; Kirby, Ent. Month. Mag. xvii. p. 85.

This species (the male of which has been well described by Mr. Smith) was taken on Oahu (not Kauai, as stated in the original description). I have not seen the female.

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## Table of Species of Prosopis.

I.	. Anterior margin of thorax yellow	:	2
•	Anterior margin of thorax not coloured yellow		3
2.	. Upper surface of hind body distinctly punctured fuscipennis	, Sm.	
	Upper surface of hind body not distinctly punctured. Kona, mil	i.	
3.	. Ventral segments even in both sexes	4	+
	Ventral segments transversely ridged in the male rugiventris	, mihi.	
4.	. Upper surface of hind body not distinctly punctured	4	5
	Upper surface of hind body with well-defined punc-	the second	
	tuation satelles, mi	hi.	
5.	Hind body black	6	5
( .	Hind body red	9	,
6.	Head short ( <i>i. e.</i> distance from eye to eye in front of		
	antennæ considerably greater than from antennæ to		
	apex of clypeus) coniceps, m	ihi.	
	Head elongate (i. e. the former of these distances not,		
	or scarcely, exceeding the latter)	7	7
7.	Apical margin of clypeus distinctly rounded	8	5
	Apical margin of clypeus truncate Blackburne	, Sm.	
8.	Basal joint of antennæ not, or scarcely, longer than		
	wide in male flavifrons, S	Sm.	
	Basal joint of antennæ much longer than wide facilis, Sm.		
9.	Yellow markings on face of male extending behind the		
	antennæ hilaris, Sm.	,	
	Yellow markings on face of male not passing behind		
	the antennæ volatilis, Sr	n.	

The following two species have been described by Mr. F. Smith in his Cat. of Hymen. Ins. pt. i. p. 23, from the Sandwich Islands. It is more than probable that they are identical with some of the species described above, but, as the descriptions are not very clear, and as I have not specimens of all the species for comparison, I have not been able to satisfy myself as to this. To make the descriptions of *Prosopis* complete, I give a copy from Smith's work of those of *P. anthracina* and *P. flavipes.*—*P. C.* 

# 11. Prosopis anthracina.

"Female. Length  $2\frac{1}{2}$  lines. Entirely black, head and thorax very finely punctured, the apical joints of the an-

tennæ testaceous beneath. Thorax, the tegulæ testaceous, the wings hyaline, the nervures dark testaceous; the enclosed portion of the metathorax longitudinally irregularly sulcate at its base. Abdomen very smooth and shining, beneath it is dark fusco-ferruginous, as well as the legs; the claws ferruginous.

"Male. The clypeus and a space on each side not touching the eyes, forming together an oval, bright yellow; the scape dilated, triangular; the flagellum testaceous beneath. Thorax, the anterior tibiæ in front, and the claws testaceous; otherwise as in the other sex.

"Hab. Sandwich Islands."

### 12. Prosopis flavipes.

"Male. Length  $2\frac{1}{4}$  lines. Black; the face yellow, the colouring is continued upwards on each side nearly to the vertex of the eye; the scape cylindrical, black, the rest of the antennæ orange, yellow beneath. Thorax, the meta-thorax has no distinctly enclosed space, and is subrugose; the wings hyaline, the nervures dark fuscous, all the tibiæ and tarsi bright yellow, the former have a ferruginous stain behind. Abdomen smooth and shining, the margins of the segments narrowly rufo-testaceous.

"Hab. Sandwich Islands."

#### APIDÆ.

## 13. Megachile diligens.

Megachile diligens, Smith, Proc. Linn. Soc. xiv. p. 684; Kirby, Ent. Month. Mag. xvii. p. 86.

Not uncommon. "Forming nests of leaves of a species of *Acacia* rolled up into cylindrical cells, which are joined one at the end of another to the length of several inches, and are placed in crevices of masonry."—T. B.

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#### 14. Xylocopa æneipennis.

Xylocopa æneipennis, De Geer, Mémoires, iii. p. 573, tab. 28. f. 8; St. Fargeau, Hym. ii. p. 186; Smith, Proc. Linn. Soc. xiv. p. 684.

Very common and extremely destructive to wood by forming its nests in it, the nests being long galleries and made in dead or living trees.

#### FOSSORES.

### VESPIDÆ.

### 15. Polistes aurifer.

Polistes aurifer, Saussure, Mon. Guêpes Soc. p. 78. Common, forming its nests in wood.

## 16. Polistes hebræus.

Vespa hebræa, Fab. Mant. Ins. i. p. 292. Polistes macaensis, Fab. Syst. Piez. p. 272.

Common in Oahu. The specimen I have is nearly identical with the figure given by de Saussure of the var. *macaensis* in his Mon. Guêpes Soc. pl. vii. f. 1. The species has a wide range over Asia &c.

#### 17. Odynerus radula.

Vespa radula, Fab. Ent. Syst. ii. p. 269.
Odynerus localis, Smith, Proc. Linn. Soc. xiv. p. 678; Kirby, Ent. Month.
Mag. xvi. p. 86.

Common on Kauai.

#### 18. Odynerus extraneus.

Odynerus extraneus, Kirby, Ent. Month. Mag. xvii. p. 86.

Hab. Kauai.

#### 19. Odynerus nigripennis.

Rhygchium nigripenne, Holmgren, Eugenies Resa, Zool. vi. p. 441. Odynerus maurus, Smith, Proc. Linn. Soc. xiv. p. 679.

Common at Honolulu.

## 20. Odynerus dromedarius, sp. nov.

Q. Robustus, subnitidus, subtiliter pubescens, punctatus, niger; fronte rubro-maculato; alis læte cæruleis; clypeo leviter emarginato; abdominis segmento primo fortiter transverso, antice verticali, segmento secundo fortiter tuberculato-elevato; metathorace haud rugoso.

## Long. 15 millim.

The head is rather closely and coarsely, but not deeply, punctured; the prothorax, mesothorax, and scutellum have two systems of punctuation,-one very fine and close, the other larger and sparing,-the larger punctures being almost non-existent on the scutellum and postscutellum. The metathorax is finely alutaceous, and bears a few rather large, but not deep, punctures. The hind body is finely and sparingly punctured to near the apex of the second segment, where the punctuation becomes (and it continues over the next three segments) coarse and rather The wings are of a very beautiful bright blue close. The elevation of the second segment of the hind colour. body gives the insect a most remarkable appearance, the summit of the "hump" into which the segment is gathered up appearing (when viewed from the side) to be abruptly raised above the first segment by about a third the total height of the segment. The pubescence (of a whitish colour) is very fine and is dense enough to prevent the surface from being very shining.

A single specimen of this most distinctive insect occurred in February on Mauna Loa, Hawaii, at an elevation of about 4000 feet, near the crater Kilauea, flying in the forest. Another (much dilapidated) specimen taken at the same time and place, is probably conspecific, but if so has lost the beautiful colour from the wings. It is devoid of

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pubescence, and therefore, I think, more shining and more conspicuously punctured. This difference, however, is so strongly defined on the metathorax that I hesitate to associate the two.

## 21. Odynerus vulcanus.

 O. vulcanus, sp. nov. Q. Robustus, vix nitidus, subtiliter pubescens, fortiter punctatus, niger; alis violaceis; clypeo vix emarginato; abdominis segmento primo fortiter transverso, antice verticali, secundo fortiter tuberculato-elevato; metathorace rugoso.

## Long. 15–16 millim.

This species is allied to the preceding, from which it differs as follows:—The apex of the clypeus is scarcely emarginate; there is no red spot on the forehead; the punctures on the head are much deeper, and therefore more distinct; the system of larger punctures on the prothorax, mesothorax, and scutellum is much closer and deeper; the metathorax is opaque and strongly rugose; the first segment of the hind body is very strongly and rather closely punctate; the second segment of the same is a little less conspicuously elevated, and the wings are violet rather than blue.

Two specimens occurred at the same time and place as the preceding.

N.B. In my collection are two males and one female of an Odynerus, taken on Mauna Kea, Hawaii, which I am unable to separate from O. vulcanus, although they appear somewhat more shining than a little rubbing would account for. The length of these males is 13 millim. Their differences from the female do not seem to call for remark, being only the usual structural differences. The small apical joint of their antennæ is of a testaceous colour.

## 22. Odynerus hawaiiensis.

O. hawaiiensis, sp. nov. Minus robustus, subopacus, subtiliter pubescens, niger; mandibulis rufis; alis violaceis; clypeo vix emarginato; capite abdomineque obscure, thorace vix evidenter punctatis; abdominis segmento primo vix transverso, antice subverticali, secundo tuberculato-elevato.

## Long. & 12 millim., $\Im$ 13–13<sup> $\frac{1}{2}$ </sup> millim.

Rather an obscure-looking species. The head is somewhat closely punctured, but the punctures are faintly impressed; the rest of the trunk appears impunctate, but opaque; when examined with a lens, however, it is seen to have a double system of punctuation, but it is all so faintly impressed as to be hardly noticeable. The metathorax is delicately alutaceous rather than punctured. The basal segment of the hind body is about as long as its greatest width, somewhat (but not abruptly) vertical in front, and thickly covered with large shallow punctures; the next two segments have fine punctures in front and large ones behind; the remainder (except the last) are coarsely but not deeply punctured. The apical joint in the antennæ of the male is testaceous. Allied to O. vulcanus. This species is easily distinguishable by its mandibles, more or less red, and by the shape of the first segment of the hind body, which is especially noticeable if looked at from the side, when it is seen to be longer (from the apex of the petiole) than high, whereas the proportion is reversed in O. vulcanus.

I have taken this insect several times on the mountains of Hawaii. It is somewhat variable; I have several specimens that I attribute to it, in which the punctuation is even more faintly impressed than in the type, and one in which the metathorax is slightly rugose. I have also a

male (possibly a distinct species) which seems a little more strongly punctured, and has the basal segment of the hind body margined with testaceous behind. I have also a female differing from the type in having the apex of the clypeus (as well as the mandibles) red. One specimen departs from the type in having the clypeus somewhat more deeply emarginate, in one or two the tuberculate form of the second segment of the hind body is only feebly developed, in another the wings are almost devoid of colouring, and in another one mandible is black.

## 23. Odynerus haleakalæ.

O. haleakalæ, sp. nov. Subnitidus, subtiliter pubescens, niger; mandibulis plus minusve rufis; alis violaceis; clypeo minus emarginato; capite thoraceque crebre fortiterque punctatis; abdominis segmento primo transverso, antice parum verticali, crassius nec fortiter punctato; segmento secundo tuberculato-elevato.
Long. ♂ 12 millim., ♀ 15 millim.

Both head and thorax have a double system of punctuation. On the head the larger punctures are so close and deep that the finer ones need looking for; on the thorax (including the scutellum) the larger ones are more sparing, while the smaller ones are more noticeable on the prothorax, but become less so backwards, being scarcely discoverable on the metathorax. The first segment of the hind body is rather strongly transverse, much rounded off (*i. e.* not vertical) in front, and is only sparingly, though rather strongly, punctate. The second segment is rather strongly elevated into a tubercular shape; it is very finely and sparingly punctate to near the hind margin, where the punctuation becomes coarse. The next three segments are coarsely punctate. The apical joint of the

antennæ in the male is testaceous. The wings are of a bright violet colour.

The general resemblance of this insect is to the preceding species, from which it differs in being much more shining and much more strongly punctate, as well as in the shape of the first segment of the hind body &c. &c. From O. congruus, Sm., it differs in the shape of the second segment of the hind body, the punctuation of the head, &c.; from O. dubiosus, Sm. (which has a faint development of the tubercular form of the second segment of the hind body), by its considerably stronger and closer punctuation, and by the much less vertical front of the basal segment of the hind body; from O. maurus, Sm., by the much less crowded punctuation of the head and thorax.

I have taken this insect occasionally on Haleakala, Maui, always at a considerable elevation (4000-6000 feet above the sea).

## 24. Odynerus congruus.

Odynerus congruus, Smith, Proc. Linn. Soc. xiv. p. 680. Hab. Honolulu : not rare.

### 25. Odynerus dubiosus.

Odynerus dubiosus, Smith, l. c. p. 681. Hab. Honolulu.

## 26. Odynerus rubritinctus.

Odynerus rubritinctus, Smith, Proc. Linn. Soc. xiv. p. 679. Not uncommon on Kauai.

## 27. Odynerus Blackburni.

Odynerus Blackburni, Kirby, Ent. Month. Mag. xvii. . 87 A succession of accidents have resulted in the publica-

tion of this name without any insect having been described under it. Some time in 1878 I presented to the British Museum a small collection of Hymenoptera containing, among other things, two red-spotted Odyneri (male and female), one specimen of each. Mr. F. Smith described them as the sexes of a new species, which he called O. rubritinctus. As I possessed the other sex of each, I knew that the differences were not sexual. Mr. Smith's lamented death prevented any further communication with him on the subject, but soon afterwards I wrote to his successor at the museum (Mr. W. F. Kirby) regarding this, and others of Mr. Smith's determinations, and the result was that Mr. Kirby published in the 'Entomologist's Monthly Magazine,' a paper to which he attached my name as well as his own, initialing each constituent part thereof. In this paper he published what I had written to him regarding O. rubritinctus, Sm., and added a note of his own, in which he proposed a new name for the male mentioned above (paving me the compliment of calling it O. Blackburni), and proposed to leave the female (on the ground, I suppose, that Mr. Smith described it before the male) in sole possession of the name O. rubritinctus, Sm. Hence of O. Blackburni, Kirby, the only description existing is one of less than five lines under the heading "O. rubritinctus" (Linn. Soc. Journ. vol. xiv. p. 674, and "Descriptions of New Species of Hymenoptera in the Collection of the British Museum, 1879"), pointing out its supposed sexual differences from its (supposed) female. I think, therefore, that it will be necessary for me now to describe O. Blackburni, Kirby, as follows :--

Subnitidus, parce subtiliter pubescens, punctatus, niger, rufo-maculatus; alis fuscis (nec violaceis); clypeo vix emarginato; abdominis segmento primo fortiter

transverso, antice verticali; segmento secundo vix tuberculato-elevato, postice haud rufo-marginato. Long. ♂ ♀ 11 millim.

Head closely set with large but shallow punctures; thorax punctured as much as the head, but with the punctures becoming more sparing backwards, the metathorax strongly rugose. The first segment of the hind body is rather closely and strongly punctured, very transverse and somewhat abruptly vertical in front, the second segment has fine and deep punctures at the base, which become gradually larger and shallower towards the apex; the segment itself only slightly approaches the tubercular form, but, viewed from the side, is seen to have a decidedly greater longitudinal convexity than the rest; the following three segments are punctured much as the apical part of the second. The insect is black, with the following parts red: the mandibles, a spot between the eyes, the tegulæ, two spots below the tegulæ, the scutellum, the postscutellum, the first segment of the hind body, a large spot on either side of the second segment. These markings are probably variable, as some of them, in one or other of my two specimens, are more or less obscured with black spots or clouds. The wings are shining fuscous, without any coloured iridescence. The legs are blackish, with shining The apical joint of the antennæ, in fuscous pubescence. the male, is obscurely testaceous.

Very closely allied to *O. rubritinctus*, Sm., but differs in the colour of the wings and in the absence of a red hind margin to the second segment of the hind body. Of fifteen specimens of *O. rubritinctus* in my collection not one varies in either of these respects.

Occurred on Kauai in August.

28. Odynerus montanus.

Odynerus montanus, Smith, l. c. p. 680. Common on mountains of Oahu.

## 29. Odynerus cardinalis.

O. cardinalis, sp. nov. Robustus, nitidus, parum pubescens, perniger; alis splendide purpureis, capite fortius confertim, thorace sparsim subtilius, punctatis; clypeo vix emarginato; abdomine sparsim subæqualiter punctato, segmento primo fortiter transverso, antice haud verticali, segmento secundo vix tuberculato-elevato.

Long. 3 9 millim., 9 12-14 millim.

Though not a large insect, nor structurally isolated, this is by far the handsomest of the Hawaiian Odyneri. The body is of a deep shining black, the wings of a really gorgeous purple colour. The head is closely and deeply punctured, but the punctures are small. The whole thorax is brightly shining, the punctuation on the prothorax and metathorax being far from crowded, that on the scutellum extremely sparing; the metathorax is almost impunctate, and is quite smooth. The hind body is brilliantly shining, sparingly set with fine punctures, which are rather evenly distributed, but become a little coarser near the apex. The first segment is very strongly transverse, and, viewed from the side, its upper outline forms a continuous gently rounded ascent from the petiole to the apical margin, no part being at all vertical. The second segment has but little indication of tendency to a tubercular form. The apical joint of the antennæ in the male is obscurely testaceous.

The nearest ally of this insect is O. montanus, Sm., from which it may be at once distinguished by the richer colour-

ing of the wings, the smooth metathorax, and the form of the first segment of the hind body (which in *O. montanus* is subvertical in front).

I have taken this fine species in several localities on Oahu. It does not seem to be confined to the mountains.

## 30. Odynerus pacificus.

O. pacificus, sp. nov. Parum nitidus, punctatus, subtiliter pubescens, niger; abdomine antice rufo; alis fuscis, obscure violaceis; clypeo antice fortius emarginato; abdominis segmento primo transverso, antice verticali.

Long. & º 11 millim.

Scarcely shining, the clypeus quite strongly emargi-The head and thorax rather roughly and closely nate. punctured, the punctures large, confused, and faintly impressed. The punctuation of the hind body resembles that of the preceding species; the basal segment is entirely red above, but obscured with black beneath; the second segment is entirely red beneath, but on the upper surface it is black at the base, and (in some specimens) more or less obscure or blackish at the apex; the remaining segments are blackish. In two of my specimens the apex of the clypeus is reddish. The apical joint of the antennæ in the male is testaceous. The wings have scarcely any violet iridescence. This is not closely allied to any other species I have seen. I have taken it singly on Maui and Hawaii.

## 31. Odynerus rubro-pustulatus.

O. rubro-pustulatus, sp. nov. Nitidus, punctatus, parum pubescens, niger; abdomine rubro-maculato; alis

fuscis, cæruleo-iridescentibus; clypeo antice truncato; abdominis segmento primo transverso, antice verticali.

Long. 3 7-9 millim.

Rather brightly shining, the pubescence scarcely dis-The head and thorax are rather strongly and cernible. closely punctured (but gradually less closely backwards), the metathorax is not very rugose. There is a red spot (absent in some specimens) behind the base of the an-The sides (broadly) and the apical margin (nartennæ. rowly) of the basal segment of the hind body are red, its undersurface is red, more or less clouded with fuscous or black; the second segment is red, except an abbreviated central line on the underside, and so much of the upper surface that the red appears as a rounded patch on either side, not extending to the base or apex; the remaining segments are black. The apical joint of the antennæ, in the male, is testaceous. The basal segment of the hind body is extremely strongly punctured, the punctures being rather elongate; the punctuation of the remaining segments does not differ much from that in the preceding The legs are of an obscure colour, with two species. fuscous pubescence.

This insect occurs on the higher mountains of Hawaii, at elevations 5000-7000 feet above the sea.

N.B. I regard as probably the female of this species some individuals of that sex taken in the same locality, which differ in being larger (long. 10–11 millim.), in having the wings of a rich blue (rather than violet) colour, and the upper surface of the basal segment of the hind body more broadly red at the sides.

## 32. Odynerus obscure-punctatus.

O. obscure-punctatus, sp. nov. Subopacus, subtiliter pubescens, niger; mandibulis rufis; abdomine rufomaculato; alis cæruleo-iridiscentibus; clypeo vix emarginato, capite thoraceque vix punctatis; abdomine punctato minus opaco, segmento primo transverso, antice verticali.

Long. 3 8-12 millim., 9 12 millim.

Less shining than the preceding, which it resembles. The head and thorax are very faintly punctured, the punctures being not at all close to each other, and hardly observable without the help of a lens. The metathorax is only slightly rugose. The pubescence is easily seen with a lens. The first two segments of the hind body are red at the sides on both the upper and undersurfaces. The hind body is evidently more shining than the thorax; its structure and punctuation are much as in the preceding species. The wings of a rich bluish purple colour. The apical joint of the antennæ, in the male, is obscurely testaceous.

This species is, in most respects, perplexingly close to the preceding. It is difficult to specify any colour difference beyond that the mandibles are, in this, red, occasionally varying to reddish pitchy, while in the former they are black varying to pitchy; and that the red markings on the hind body, though similar in form and distribution, are generally smaller in this than in the other; the proportions of the red and black on the underside of the hind body vary in both species. The punctuation of the head and thorax, however, is so entirely different in the two, without appearing to vary, that I must consider them distinct.

Not rare on the higher mountains of Hawaii.

# 33. Odynerus diversus.

O. diversus, sp. nov. J. Subnitidus, crasse punctatus, niger, rufo-maculatus; alis hyalinis, harum nervulis et parte anteriori nigro-fuscis; clypeo antice fortiter emarginato; abdomine dense fusco pubescente, segmente primo fortiter transverso, antice haud verticali, secundo vix tuberculato-elevato.

2. Clypeo vix emarginato.

Long. 12-14 millim.

Black, with the following parts red, viz .: - A spot behind the base of the antennæ, the greater portion of the prothorax, some spots on the tegulæ and a spot below them, some spots on the scutellum and postscutellum, the hind margin of the basal segment of the hind body, the hind margin of the second segment and an oblique spot on each side of the same, and the hind margin of the third seg-The head is closely and coarsely punctured; the ment. thorax has a double system of punctuation, the smaller punctures not very close, the larger very coarse; the metathorax is coarsely punctured, but scarcely rugose; the hind body is sparingly punctured, the punctures obscure and lightly impressed, but becoming stronger in the apical half, the basal segment very strongly transverse, and not at all vertical in front. The fuscous pubescence on the hind body is fine and quite dense, giving the insect a silky appearance.

I have one male and three females of this distinct species; all were captured on the mountains of Oahu. The difference between the clypeus of the male and of the female is so exceptionally strong, that I suspect the male of being a variety, though I notice a slight (indeed scarcely discernible) difference of the same kind in most species of the genus in my collection.

### 34. Odynerus agilis.

## Odynerus agilis, Smith, l. c. p. 681.

To this species I attribute numerous individuals captured by me in various localities on Maui, Lanai, and Hawaii. If I am right in doing so, this is one of the most variable species of the genus, and the original description needs the addition of the following note :---

The degree of intensity with which the punctuation on the thorax is impressed differs in almost every two specimens, until in the extreme form no punctuation is visible without the use of a lens, by means of which, however, it is seen that the punctures of the type are present, only with the appearance of having been very nearly oblite-The mandibles vary in colour to pitchy, and even rated. The yellow spot behind the base of the antennæ red. is generally absent. The postscutellum is occasionally spotted with yellow. One or other, or both, of the yellow rings on the hind body may be extremely indistinct or wanting. The length varies from 12-16 millim. The female does not noticeably differ from the male, except by the usual sexual characters.

The distinctive features of the species are its whitish pubescence and the extremely strong emargination of the apex of the clypeus, the edges of the emargination being more or less strongly produced forwards in an almost cylindric shape.

## 35. Odynerus insulicola.

O. insulicola, sp. nov. Subnitidus, pubescens, minus crebre punctatus, niger, flavo-notatus; alis subhyalinis obscure cæruleo-iridescentibus; clypeo antice emarginato; abdominis segmento basali transverso, antice verticali.

Long. & \$ 9-11 millim.

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The punctuation of the head and thorax is rather deep, but not coarse, and is somewhat sparsely distributed, becoming even more sparing on the scutellum and postscutellum. The metathorax is feebly rugose. The basal segment of the hind body is strongly and moderately closely punctate, while the punctures of the second segment are fine, becoming coarser towards the apex, and the punctuation so continues on the other segments. The tibiæ and tarsi are much clothed with ashy pubescence, and there is a good deal of whitish pubescence on the body.

The male has the following parts yellow, viz.:—The clypeus (wholly or in part), the front of the scape and the apical joint of the antennæ, some spots on the prothorax, on the tegulæ, and on the tibiæ, and the dorsal hind margin of the basal two segments of the hind body. Some or other of these markings are wanting in most specimens, but I have seen none in which the clypeus is not entirely (or very nearly so) of a bright yellow colour. The female is quite devoid of colour, save that in some specimens the apical dorsal margin of one or both of the basal two segments of the hind body is obscurely testaceous.

This insect occurs on the sandy isthmus forming the middle of the island Maui, and on the adjacent lower slopes of Haleakala.

N.B. I possess a single male specimen of an Odynerus captured on Oahu, which is probably distinct from the species last described, but is too closely allied to be treated as new without the examination of a series of examples, especially in consideration of my knowledge of the extent to which the coloured markings of the Hawaiian Odyneri vary. It has all the yellow markings of a male O. insulicola (except those on the flagellum), with the addition of

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the following :—a spot on the head behind the base of the antennæ, the scutellum and postscutellum, and a large spot below the tegulæ. The posterior margin of the basal segments of the hind body is more broadly yellow, the basal segment itself appears a little more strongly transverse, and the punctuation of the whole insect a little more sparing.

#### CRABRONIDÆ.

## Crabro.

As it seems desirable to furnish some further remarks on the species of this genus already described, I think it will be well for me to make a brief review of them, interpolating descriptions of the new species in my collection.—T. B.

## 36. Crabro affinis.

## Crabro affinis, Smith, Proc. Linn. Soc. xiv. p. 677.

In this species the eyes are only moderately separated in front, and the space between them is not (as compared with same space in *C. mandibularis*) strongly concave near the base of the antennæ. The punctuation of the head is quite evidently (though not at all strongly) rugose, especially in the male, and there are very distinct traces of longitudinal strigosity. The eyes are facetted excessively finely in both sexes. The hind body is rather wide in the middle, thus being strongly rounded laterally.

I possess a single male taken in company with the female I sent to Mr. Smith, and clearly conspecific. The sexual differences here are very similar to those in *C. mandibularis*, Smith. The mandibles of the male are pitchy black, the face and clypeus silvery, the basal joint of the antennæ reddish pitchy (paler at the base), and a little dilated in the middle. The sexual character in the sixth

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joint of the antennæ consists in little more than an emargination, the apex of the joint being scarcely dentate. The second ventral segment is not at all flattened, the third scarcely, the fourth quite evidently so; the remaining segments are concave. The yellow bands on the hind body are all entire, the basal one very broad, the second narrow, the last broad.

I have no doubt the yellow markings in this species are subject to great variety.

## 37. Crabro mauiensis.

 C. mauiensis, sp. nov. Q. Subnitidus, pubescens, crebre subtiliter punctatus, niger, flavo-ornatus; clypeo aureo-piloso; alis hyalinis, infuscatis; abdomine nitido, in medio lato, vix evidenter punctato.

Long. 9 millim.

The yellow markings are as follows:—The basal two thirds of the upper surface of the mandibles, the anterior face of the basal joint of the antennæ, the sides of the prothorax and a spot near the tegulæ, the postscutellum, an interrupted band on the second dorsal segment of the hind body, a band on the fourth segment, and a spot on the fifth. The eyes are moderately facetted and not strongly separated (as compared with other species), and the forehead is strongly concave. The head is closely, finely, and smoothly punctate. The punctuation of the mesothorax is obscure, that of the scutellum and metathorax extremely fine, these parts being, however, rather strongly strigose longitudinally. The pubescence is whitish, but there is not much of it in my specimen, which is possibly abraded.

Though this insect is closely allied to C. affinis, Smith, the much smoother punctuation of the head, on which

there is no distinct strigosity, the evidently coarser facets of the eyes and the more strongly concave forehead indicate, I think, that it is a distinct species.

A single female occurred on Maui, near Wailuku, flying over flowers.

## 38. Crabro distinctus.

Crabro distinctus, Smith, Cat. of Hymen. Ins. iv. p. 422.

This seems to be different from any of the species described by Mr. Blackburn. The following is Smith's description (P. C.) :=

"Female. Length 3 lines. Black; the head and thorax opaque; the stemmata in a curve on the vertex; the face canaliculated; the inner orbit of the eye, halfway towards the vertex and the clypeus, covered with golden pubescence; the scape and mandibles yellowish white, the tips of the mandibles, and a narrow stripe on the scape within, black. Thorax: an interrupted line on the collar, the tubercles (and a spot behind), the scutellum, and postscutellum yellowish white; wings faintly coloured and iridescent. Abdomen: the basal segment with a large transverse irregularly-shaped spot, which is somewhat arched in front, and with two deep rounded emarginations behind, which have a wide outside extending to the apex of the spot; the second, fourth, and fifth segments have an uninterrupted fascia at their base of a yellowish white; the apical segment shining and punctured.

"Hab. Sandwich Islands."

## 39. Crabro mandibularis.

Crabro mandibularis, Smith, Proc. Linn. Soc. xiv. p. 677 (♀). Crabro denticornis, Smith, Proc. Linn. Soc. xiv. p. 678 (♂); Kirby, Ent-Month. Mag. xvii. p. 87.

I feel no doubt whatever as to the specific identity of these two forms, separated with considerable hesitation by

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Mr. Smith. As the female was described before the male, and the latter (as compared with most of its Hawaiian congeners) does not deserve the name *C. denticornis*, the species had better be called *C. mandibularis*.

The space between the eyes is exceptionally narrow and strongly concave. The head is very finely and smoothly punctured, with scarcely any traces of strigosity. The eyes are facetted finely in the male, by no means finely in the female. The hind body is narrow and not at all strongly rounded laterally. The ventral segments of the male resemble those of the same sex in *C. affinis*.

This species varies in colour. I have a male in which there is no yellow tint on the postscutellum.

## 40. Crabro polynesialis.

Crabro polynesialis, Cameron, Trans. Ent. Soc. 1881, p. 562.

Mr. Cameron's description requires no supplement beyond a word as to the differences between this and other species (not in Mr. C.'s possession), and a remark on the male.

The eyes are rather close to each other in front, though a little more separated than in C. mandibularis, Smith, and are quite strongly facetted, much more so than in C. affinis. The hind body is similar in shape to that of C. mandibularis.

In the male the antennal sexual characters are almost as in *C. mandibularis*, while the ventral depression extends quite evidently from the middle of the third segment to the apex.

Hab. Mauna Loa, Hawaii, at an elevation of 4000 feet.

### 41. Crabro abnormis.

C. abnormis, sp. nov. J. Minus nitidus, pubescens, creberrime subrugoso-punctatus, niger; clypeo fronteque

lucide argenteo-pilosis, femoribus anticis antice testaceis; alis hyalinis, parum infuscatis; abdomine sat nitido, subtiliter minus crebre punctato; antennarum articulo primo subfusiformi, quinto abrupte incrassato, sexto valde acute dentato, dente quam articulus vix breviori.

Long. II millim.

The space between the eyes is much as in the preceding species, the granulation of the eyes being a little coarser than the male C. mandibularis, Smith. The head is very finely and closely punctured, and is clothed with longish fuscous hairs. The prothorax and mesothorax are finely and closely (but not very smoothly) punctured, and are clothed with fuscous hairs. On the scutellum, postscutellum, and metathorax the punctuation becomes shallow, sparing, and decidedly coarse (while there is also a fine and close punctuation), and the hairs are long and whitish. The basal segment of the hind body is clothed with long whitish hairs, the remaining segments and near the apex are devoid of hairs (in my specimen possibly abraded), and on the penultimate and apical segments there are traces of golden pubescence. The punctuation of the hind body, even to the apex, is almost obsolete. The apical third of the second ventral segment is strongly flattened or even a little concave in the middle, nearly the whole of the third segment is distinctly concave, and the remaining segments are all strongly flattened.

A single specimen of this very distinct insect occurred on Konahuanui, Oahu, at an elevation of about 2500 feet.

My collection contains a specimen of a female *Crabro* with yellow mandibles, taken at Oahu, that may possibly prove to be a female *C. abnormis*, with the punctuation not quite in its typical condition. It resembles the male

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in the brilliancy of the silvery pilosity on the clypeus, and in other points. Its eyes are considerably more strongly facetted. The punctuation differs slightly; on the mesothorax it appears a triffe more sparing and rugose, while the metathorax is smoother and more evenly punctured.

## 42. Crabro unicolor.

Crabro unicolor, Smith, Cat. of Hymen. Ins. iv. p. 421.

I have not seen the original description of this insect; my own examples were named by Mr. Smith. As compared with other Hawaiian species, the eyes appear to be separated by about the usual space (or even a little more) and to be facetted rather coarsely. The shape of the hind body is similar to that of *C. mandibularis*, being evidently longer and narrower than in *C. affinis* and *C. stygius* and their allies. The bright steely-blue colour of the wings is a conspicuous character. In the male the sixth joint of the antennæ is distinctly but not strongly dentate, and the flattened or concave space on the ventral segments begins near the apex of the third segment.

I have met with this insect on Oahu and Maui. It appears to be the commonest of the Hawaiian Crabronidæ, probably occurring on all the islands.

## 43. Crabro stygius.

Crabro stygius, Kirby, Ent. Month. Mag. xvii. p. 88.

The extremely wide separation of the eyes (between which the forehead is scarcely concave), which is exaggerated to the utmost in the female, is the striking feature of this and the following two species. The eyes are rather finely facetted, the hind body resembles in shape that of *C. affinis*, Smith, and in the male the sixth joint of the antennæ is feebly dentate. In this sex the character of the ventral segments is rather peculiar, consisting of a

concavity (feeble as a whole) commencing at the fourth segment, but being deepened near the middle of each individual segment. In the female the penultimate dorsal segment of the hind body is densely punctured and set with close red pubescence. I think, too, that the surface of the segment itself is reddish. The wings are almost absolutely devoid of colour in both sexes.

Hab. Oahu.

## 44. Crabro adspectans.

- C. adspectans, sp. nov. Subnitidus, pubescens, distincte minus crebre punctatus, niger, flavo ornatus; tibiis anticis rufo-hirsutis; alis infuscatis; abdomine pubescenti, nitido, in medio lato, vix evidenter punctato.
- 3. Antennarum articulo sexto dentato, abdominis segmentis duobus ultimis supra rufo-pubescentibus.
- Q. Abdominis segmento penultimo supra dense rufohirsuto.

Long. 12 millim.

The yellow markings are placed on the prothorax, scutellum, and postscutellum (in the female there is a large yellow spot on the second ventral segment of the hind body); they are much less conspicuous (judging by my specimens) in the male than in the female, but are probably subject to variation in both sexes. The head is shining and very distinctly punctured, the punctures being rather crowded behind the base of the antennæ and becoming gradually more sparing backwards; the mesothorax is shining and is distinctly and evenly punctured; the punctuation of the metathorax is rather coarse. The hind body is quite shining, but its brightness is hidden by close short whitish pubescence. In the male the apical half of the penultimate, and the whole of the apical segment, are rather densely covered with rather long golden-

red pubescence, which is still more conspicuous on the whole of the penultimate segment in the female; in this sex the elongate apical segment also having a dense fringe of long golden-red hairs. In both sexes the clypeus, front of the head, and front tibiæ are set with long golden-red hairs. In the male the tooth on the sixth joint of the antennæ is only moderately developed, and the ventral segments resemble those of *C. stygius*, Kirby.

This beautiful species is allied to C. stygius, Kirby, which it resembles in having the eyes widely separated and the space between them but little concave. The eyes are excessively finely facetted, and the hind body is shaped as in C. stygius &c.

A single pair occurred on Haleakala, Maui, at an elevation of about 5000 feet.

# 45. Crabro rubro-caudatus.

C. rubro-caudatus, sp. nov. ♂. Vix nitidus, pubescens, obscure punctatus, niger; alis late cæruleis; abdomine in medio lato, segmentis sexto et septimo dense aureo-pilosis.

Long. 10 millim.

The head and thorax are excessively finely punctured, and are obscurely and confusedly sprinkled with a larger system of punctures. The punctuation is rougher and more obscure on the metathorax than on the anterior parts, and there are some conspicuous oblique wrinkles about its sides. The first five segments of the hind body are brightly shining, and are distinctly finely and rather closely punctured, without much pubescence; the apical two segments are very conspicuously and densely clothed with long golden-red hair. The pubescence of the head and thorax is rather dense, but not conspicuous, being of a dark colour. The wings are of a beautiful clear blue

(it is remarkable in how many of the Hymenoptera taken near the crater of the active volcano this colour appears). The eyes are separated in the last two species named above, and are excessively finely facetted. The face is little concave. The denticulation of the sixth joint of the antennæ is only moderate. The ventral segments resemble those of *C. stygius* and *C. adspectans*.

In the same locality as the male *C. rubro-caudatus* I procured two examples, which are probably its female. As, however, they differ rather exceptionally, I hesitate to assign them to this species with certainty, for the wings are entirely devoid of the blue tint. In other respects they might well be the female *C. rubro-caudatus*. The penultimate and apical segments in the hind body of these specimens do not seem to differ much from the same parts in the female *C. adspectans*.

Occurred on Mauna Loa, Hawaii, at an elevation of about 4000 feet, in close proximity to the burning crater.

## LARRIDÆ.

## 46. Pison iridipennis.

Pison iridipennis, Smith, Proc. Linn. Soc. xiv. p. 676. Hab. Honolulu.

### 47. Pison hospes.

Pison hospes, Smith, lib. cit. p. 676.

Hab. Oahu, Kauai, and Maui. Not uncommon.

#### SPHEGIDÆ.

### 48. Pelopæus cæmentarius.

Sphex cæmentaria, Drury, Exot. Ins. i. p. 105.

Pelopeus flavipes, Fab. Syst. Piez. p. 202; Smith, Proc. Linn. Soc. xiv. p. 676.

A common species in the islands, and, according to

Mr. Blackburn, provisions its nest with spiders. The var. *flavipes*, Fab., *sec.* Saussure, and var. *limatus*, Fab., *sec.* Sauss. (*cf.* Hymen. der Novara Reise, p. 30), both occur, the latter being distinguished from the former by the greater extension of the yellow on the thorax, the metanotum being nearly all yellow. The species has a wide range in North America, but does not, I think, extend further south than Mexico.

## 49. Mimesa antennata.

Mimesa antennata, Smith, Cat. of Hymen. Ins. iv. p. 431.

Hab. Maui.

## HETEROGENA.

#### FORMICIDÆ.

### 50. Camponotus sexguttatus.

Formica sexguttatus, Fab. Ent. Syst. ii. p. 354.

Hab. Honolulu, in a house. Common in South America.

#### 51. Tapinoma melanocephala.

Lasius melanocephalus, Fab. Syst. Piez. p. 417.

A few specimens in a house at Lahaina, Maui.

The only locality from which this species has been recorded is Cayenne.

## 52. Prenolepis longicornis.

Formica longicornis, Latr. Hist. Nat. d. Fourm. p. 113.

## Hab. Honolulu.

A widely-distributed species; found in Europe, in hothouses.

### 53. Prenolepis obscura, Mayr.

Prenolepis obscura, Mayr, Verh. zool.-bot. Ges. Wien, 1862, p. 698; Formicidæ der Novara Reise, p. 52, pl. ii. figs. 15 & 15<sup>a</sup>.

Smith records this species as Prenolepis clandestina,

Mayr, but it is, I believe, *P. obscura*, for I cannot find any trace of pubescence on the mesonotum. Mr. Blackburn has taken the male, which has not been described. It is dark brown; the antennæ are testaceous, the scape a little darker than the flagellum; the mouth, base of the legs, and tarsi pale yellowish testaceous, the femora and tarsi fuscous, pale beneath. Head and thorax shining, finely shagreened, and bearing some longish (comparatively) blackish hairs. Abdomen shining, impunctate, the apical half bearing longish black hairs. Wings brownish yellow, but not deeply, the nervures pallid testaceous. The apex of the abdomen is pale yellow. The only specimen I have appears to be somewhat immature.

The species has only been recorded from Australia.

## PONERIDÆ.

### 54. Ponera contracta.

Formica contracta, Latr. Hist. Nat. d. Fourm. p. 195, t. 7. f. 40.

Rare in Oahu. A widely-distributed species over the world.

## 55. Leptogenys insularis.

Leptogenys insularis, Smith, Proc. Linn. Soc. xiv. p. 675.

Smith only describes the worker of this species. The male (the female I have not seen) is black, the antennæ on lower side of scape incline more or less to fuscous, the spurs and trophi pale testaceous; tips of mandibles fuscous; apex of abdomen (broadly) and antennæ rufotestaceous; anterior tarsi inclining to testaceous at apex. Head and thorax opaque, alutaceous, covered with a fine close ashy pile; apex of abdomen with long pale hairs. Head narrower than thorax, clypeus almost transverse at apex; eyes reaching a little below the base of antennæ and not far from the base of the mandibles; ocelli promi-

nent; there is a fine  $\Lambda$ -shaped furrow over the antennæ. Antennæ with a short pedicle at the base, 13-jointed, microscopically pilose; the basal joint three times as long as the second (a little longer than the basal joint of the flagellum, which is shorter than the second; the other joints longer, the last is longer than the twelfth; a fine keel runs down the centre of the mesonotum, the sutures dividing the front lobe shallow; sides of scutellum behind shining, obliquely striated; the apical half of the metanotum with several stout transverse keels. Abdomen opaque, finely alutaceous, longer than the head and thorax united. First segment shorter than the second; its suture at base smooth and shining, the apex striated; the tooth on lower side short, thick, slightly curved (the node as in worker). Wings hyaline, the apex in front of stigma smoky; nervures testaceous, stigma fuscous.

### MYRMICIDÆ.

### 56. Monomorium specularis.

Monomorium specularis, Mayr, Sitz. d. Math.-Nat. Wien, 1866, p. 509.

Hab. Honolulu.

This is a South-Sea Island species; also found in Brazil.

### 57. Tetramorium guineense.

Formica guineense, Fab. Ent. Syst. ii. p. 357.

Hab. Oahu. Common in the tropical parts of America, in Manilla, and Australia, and in hothouses in Europe.

### 58. Pheidole megacephala.

Formica megacephala, Fab. Ent. Syst. ii. p. 361. Ecophthora pusilla, Heer, Ueber die Hausameise Madeiras.

Hab. Honolulu. One of the commonest ants in the

Archipelago. The nests are formed under stones. A very widely-distributed species. Found in hothouses in Europe.

59. Solenopsis geminata.

Atta geminata, Fab. Syst. Piez. p. 423.

Hab. Honolulu, in palm-trees.

## OXYURA.

#### 60. Scleroderma polynesialis.

Scleroderma polynesialis, Saunders, Trans. Ent. Soc. 1881, p. 116.

Hab. Haleakala, Maui, at an elevation of 4000 feet.

61. Sierola testaceipes.

Sierola testaceipes, Cameron, Trans. Ent. Soc. 1881, p. 556.

## 62. Sierola monticola, sp. nov.

Black; anterior tibiæ and tarsi testaceous, the tips of the latter black; the base and apex of hind tibiæ fuscotestaceous, the tarsi fuscous, paler in the middle; the extreme base and apex of basal joint of antennæ and the second to fourth joint testaceous. Antennæ scarcely so long as the thorax; the basal joint pear-shaped, narrowest at the base, a little longer than the third and fourth united; second joint a little longer than third, and of the same thickness; second to fourth longer and thicker than the other joints; the apical seven more moniliform than the others, and a little longer than broad; the last longer and thinner than the penultimate. Head smooth and slightly alutaceous; mandibles piceous at tip, faintly striated; thorax smooth, a little alutaceous. The abdominal segments laterally at their junction narrowly milk-white.

Wings hyaline, stigma and prostigma fuscous; nervures testaceous. Female.

Length 4 millim.

Differs from S. testaceipes in being longer and stouter; in the antennæ being longer, the basal joint being longer and more pear-shaped, the other joints also not being so thick nor so moniliform; in the abdomen being shorter and broader, it being almost shorter than the head and thorax united, the segments, too, not being broadly testaceous at their edges; the femora are black; the head is more narrowed in front of the eyes; the wings are longer, and the nervures are darker.

Hab. Mountains of Hawaii (no. 134).

## 63. Sierola leuconeura, sp. nov.

Black; the knees, tibiæ, tarsi, and basal half of antennæ testaceous; the hind tibiæ fuscous in the middle; antennæ scarcely so long as the thorax, the basal joint shortly pedunculated, double as long as wide, double the length and thickness of the second, which is thinner and shorter than the third, the third to sixth thicker than the following, broader than long, the apical two joints subequal. Head and thorax smooth, faintly alutaceous. Abdomen shining, longer than the thorax. Wings semifuscous; stigma and prostigma fuscous, nervures lacteous.

Length 2 millim.

The nervures are so colourless that I cannot make out if the small oval cellule uniting the humeral cellules is present or not; if absent the species would form the type of a new genus, as genera are now considered.

Hab. Lanai.

## TEREBRANTIA.

ICHNEUMONIDÆ.

## Pimplides.

## 64. Echthromorpha maculipennis.

Echthromorpha maculipennis, Holmgren, Eugenies Resa, Zoologi, vi. p. 406, tab. viii. f. 3.

Hab. Honolulu.

## 65. Echthromorpha flavo-orbitalis, sp. nov.

This species differs from E. maculipennis as follows:— The face is entirely yellow, the eyes are narrowly bordered with yellow except at the top, the scape beneath, and the anterior coxæ and trochanters, the basal half of the scutellum, and the postscutellum are yellow; the wings are much more darker tinted, the nervures and stigma are quite black; the metanotum is more strongly punctured, and the oblong depression found near the base in E. maculipennis is absent; the punctuation on the abdomen is stronger, there being also a distinct punctuation on the second segment, and the transverse impressions are more conspicuous. Possibly an examination of a large series of specimens may prove that E. flavo-orbitalis is only a variety of E. maculipennis.

The maxillary palpi in this genus are 5-, and the labial 3-jointed.

## 66. Pimpla hawaiiensis, sp. nov.

Black; legs red, the anterior tibiæ inclining to yellowish in front, the hind tibiæ and tarsi black, the extreme base of hind tibiæ and a broad band above the middle and the spurs white; the tips of four anterior tarsi black; extreme base of posterior testaceous. Antennæ scarcely so long as the thorax and abdomen united, stoutish, taper-

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ing towards the apex; inclining to brown on the lower side, covered with microscopic pile. Head as wide as the thorax, shining, impunctate, the face somewhat protuberant, covered sparsely with white hairs; front a little depressed above the antennæ; clypeus clearly separated; maxillary palpi testaceous, labial fuscous. Thorax shining, impunctate, the mesonotum sparsely, sternum and metapleuræ denselv covered with longish white hair; metanotum without any keels, the thoracic spiracle oblong. Abdomen about double the length of the thorax, covered with a longish white pubescence; base of petiole excavated, the middle portion sparsely punctured; apical part shining, impunctate, separated from the part in front by The other segments (except the being a little raised. apical) are closely and rather strongly punctured; the second is longer than broad; the others to the seventh broader than long; the seventh is longer than broad; the eighth is narrowed gradually to the apex; the cerci are three times longer than broad, stout, pilose. The edges of the second segment are testaceous at the base and apex. Wings hyaline, shorter than the thorax and abdomen; the nervures and stigma black; areolet 4-angled, angled on lower side; the lateral nervures uniting at top; the recurrent nervure angled a little above the middle.

Hab. Oahu.

## Tryphonides.

67. Metacœlus femoratus.

Exochus femoratus, Grav. Europ. Ich. ii. p. 346.

Hab. Oahu.

## Ophionides.

## 68. Ophion lineatus.

Ophion lineatus, Cameron, Trans. Ent. Soc. 1883, p. 192. Hab. Hawaii, Lanai.

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## 69. Ophion nigricans.

Ophion nigricans, Cameron, l. c. p. 193. Hab. Hawaii.

## 70. Limneria polynesialis.

Limneria polynesialis, Cameron, l. c. p. 191.

Hab. Haleakala, Maui, at an elevation of about 4000 feet.

## 71. Limneria Blackburni.

Limneria Blackburni, Cameron, l. c. p. 192.

Hab. Mauna Kea, Hawaii, at an elevation of at least 13,000 feet, on the snow near the summit.

## 72. Limneria hawaiiensis, sp. nov.

Very similar in coloration and size (except that it is somewhat smaller) to L. Blackburni, but differing from it in the head and thorax being densely covered with silvery-white pubescence, on L. Blackburni (especially on the thorax) it being very sparse and the pleuræ almost glabrous; the posterior median area of the metanotum is narrower and longer; the femora are of a much paler red, the four posterior trochanters are entirely yellow, there is no black at the base of the hind femora, the black on the tibiæ is lighter, the four anterior tarsi are pale testaceous without any black, and the areolet is not only longer, but is also somewhat wider; the postpetiole is more strongly punctured, as are also the second and third segments, and the apical segments are more densely covered with white hair, the hair being also longer. The apex of the second segment and the greater part of the third segment externally are testaceous.

Hab. Oahu.

The three species of *Limneria* known from the islands are so closely allied to each other that I have no doubt that they have been evolved from one stem; in fact, I am

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not sure but that if we had a long series of each, it would be found that they were varieties of one species. It is noteworthy that they are all from the mountains. The three species may be known as follows :—

1 (2).	Stigma and nervures pallid testaceous; areolet nearly	
	pedunculated; first transverse humeral nervure not	
	interstitial	polynesialis.
2 (1).	Stigma fuscous, nervures black; first transverse humeral	
	nervure interstitial.	
3 (4).	Head and thorax densely covered with white pubescence,	
	four anterior tarsi and middle tibiæ without black;	
	the base of hind femora without black	hawaiiensis.
4 (3).	Head and thorax not densely pilose, four anterior tarsi	
	and middle tibiæ marked with black; base of hind	
	femora black	Blackburni.

### BRACONIDÆ.

## 73. Chelonus Blackburni.

Chelonus carinatus, Cameron, Trans. Ent. Soc. 1881, p. 559 (non Cresson). Hab. Oahu.

74. Monolexis? palliatus.

Monolexis? palliatus, Cameron, l. c. p. 560. Hab. Near Honolulu. Not common.

#### EVANIIDÆ.

75. Evania sericea.

Evania sericea, Cameron, Trans. Ent. Soc. 1883, p. 191. Hab. Hawaii and Oahu.

76. Evania lævigata.

Evania lævigata, Latr. Gen. Crust. et Ins. iii. p. 251. Hab. Common about Honolulu.

### CHALCIDIDÆ.

## 77. Epitranus lacteipennis.

Epitranus lacteipennis, Cameron, Trans. Ent. Soc. 1883, p. 187. -Hab. Oahu.

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## 78. Chalcis polynesialis.

Chalcis polynesialis, Cameron, Trans. Ent. Soc. 1881, p. 561. Hab. Near Honolulu.

79. Spalangia hirta.

Spalangia hirta, Haliday, Ent. Month. Mag. i. p. 334.

In an outhouse near Honolulu. Probably introduced, being a parasite on the house-fly. It is a European species.

## 80. Moranila testaceipes.

Moranila testaceipes, Cameron, Trans. Ent. Soc. 1883, p. 188.

Hab. Oahu.

81. Solindenia picticornis.

Solindenia picticornis, Cameron, Trans. Ent. Soc. 1883, p. 189.

Hab. Oahu.

82. Eupelmus flavipes.

Eupelmus flavipes, Cameron, l. c. p. 190.

## 83. Encyrtus? insularis, sp. nov.

Dark blue; the antennæ, apex of fore femora, apical third of middle and apical half of hind femora, the tibiæ and tarsi yellowish testaceous, base of four anterior tibiæ fuscous; club of antennæ darker than scape; abdomen more or less green. Wings hyaline, nervures testaceous. Head covered with large, distinctly separated punctures; thorax more closely punctured, the punctures being also smaller than those on the head; scutellum closely and more finely punctured than the mesonotum; abdomen shining, impunctate. Head and mesothorax finely and sparsely pilose; scutellum densely pilose; abdomen glabrous.

Scape of antennæ longer than the flagellum, nearly cylindrical, but slightly thickened towards the apex, the flagellum 7-jointed, the first six broader than long, the

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edges projecting, forming a serration broader than long, becoming gradually broader until the sixth is double as wide as long; last joint (forming a club) longer than the preceding six; the apex produced laterally, the elongation forming about one fourth of the total length, and half the thickness of the central part; the club becomes gradually thickened towards the apex. The flagellum is covered with longish stiff hairs, directed towards the apex. Head broad, rather large; eyes large, converging above; ocelli in a wide triangle, widely separated, the upper two nearly touching the eyes; occiput concave. Face deeply excavated, the excavation reaching laterally to the mouth; epistoma projecting, broadly keeled. Thorax large, broad, without sutures; scutellum large; metathorax small. Abdomen shorter than the thorax, the apex narrowed, transverse. Wings scarcely so long as the body; cubitus more than double the length of ulna, which is very short; radius absent; edge of wing shortly ciliated. The cubitus does not reach to the middle of the wing. Hind tibiæ almost one-spurred, the inner being a mere stump.

The above-described species is certainly not an *Encyrtus* as now understood. I cannot make it fit into any of the genera as defined by Mayr and Fœrster; but having only a single example (a male), I do not care to found a new genus for its reception. The sculpture of the head and thorax is pretty much as in *Bothriothorax*.

Taken on several of the islands.

Obs. Mr. Blackburn (anteà, p. 199) states that he has taken in the Archipelago over one hundred species of Hymenoptera; but I am only acquainted with eightythree (or eighty-four with Apis mellifica). I believe there are two or three undescribed species in the British Museum, which were sent by Mr. Blackburn some years ago.—P. C.



Blackburn, Thomas and Cameron, Peter. 1887. "On the Hymenoptera of the Hawaiian Islands." *Memoirs of the Literary and Philosophical Society of Manchester* 10, 194–244.

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