

INSECTS OF SAMOA AND OTHER SAMOAN TERRESTRIAL ARTHROPODA

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Insects of Samoa and other Samoan Terrestrial Arthropoda. Maps 1 and 2 (in envelope). 1927, 4to. 6d.

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23rd July, 1927.

Department of Entomology.

Keeper's Study.

BRITISH MUSEUM (NATURAL HISTORY) [*Recd. 26. vi. 1929.*]

INSECTS OF SAMOA

AND OTHER SAMOAN TERRESTRIAL ARTHROPODA

PART IV. COLEOPTERA

FASC. 4. Pp. 217-248

PLATYPODIDAE AND SCOLYTIDAE

By C. F. C. BEESON, D.Sc.

WITH THIRTEEN TEXT-FIGURES



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INSECTS OF SAMOA

AND OTHER SAMOAN TERRESTRIAL ARTHROPODA

Although a monograph, or series of papers, dealing comprehensively with the land arthropod fauna of any group of islands in the South Pacific may be expected to yield valuable results, in connection with distribution, modification due to isolation, and other problems, no such work is at present in existence. In order in some measure to remedy this deficiency, and in view of benefits directly accruing to the National Collections, the Trustees of the British Museum have undertaken the publication of an account of the Insects and other Terrestrial Arthropoda collected in the Samoan Islands, in 1924-1925, by Messrs. P. A. Buxton and G. H. E. Hopkins, during the Expedition of the London School of Hygiene and Tropical Medicine to the South Pacific. Advantage has been taken of the opportunity thus afforded, to make the studies as complete as possible by including in them all Samoan material of the groups concerned in both the British Museum (Natural History) and (by courtesy of the authorities of that institution) the Bishop Museum, Honolulu.

It is not intended that contributors to the text shall be confined to the Museum Staff or to any one nation, but, so far as possible, the assistance of the leading authorities on all groups to be dealt with has been obtained.

The work is divided into eight "Parts" (see p. 3 of wrapper), which are subdivided into "Fascicles." Each of the latter, which appear as ready in any order, consists of one or more contributions. On the completion of the work it is intended to issue a general survey, summarising the whole and drawing from it such conclusions as may be warranted.

A list of Fascicles already issued will be found on the back of this wrapper.

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INSECTS OF SAMOA

PART IV. FASC. 4

PLATYPODIDAE AND SCOLYTIDAE

By C. F. C. BEESON, D.Sc.

(With 13 Text-figures.)

UNTIL the present collection was examined scarcely anything was known of the Platypodidae and Scolytidae of Samoa, and only three species have been recorded from other islands in Polynesia. Friedrichs apparently took two species of Scolytidae on Upolu, one of which (No. 20) has recently been described by Eggers. The Scolytoid fauna of the Papuan region is also far more imperfectly known than that of the Oriental and Manchurian regions. While this has facilitated the study of the material at Dehra Dun, without recourse to more extensive collections than that of the Forest Research Institute,* it has emphasised the contrast between presumed endemics and introduced species, and has exaggerated the relationships of the Samoan fauna to that of the Oriental region.

Thirty-six species are listed here, of which twenty-three are endemic and thirteen are widely distributed. Of the endemic species, seventeen display close affinities with species in the Oriental region, particularly in the Malayan and Ceylonese subregions; only one species finds its nearest relative in America; the remaining five do not possess features characteristic of any particular region. Nine genera are represented, of which six are widespread and very rich in species, two are restricted to the Papuan and Oriental regions and one was previously known only as occurring in Ceylon. The Scolytoid beetles of the

* The determination of the Samoan collection was to have been undertaken by the late Lt.-Col. F. Wynn Sampson, and it was in his hands at the time of his death in November, 1926, but there is no record that any of the specimens were definitely identified by him.

Hawaiian Islands have three widespread species in common with Samoa, but their endemics are quite distantly related.

The constitution of the bark-beetle (Scolytidae) and pin-hole borer (Xyleborinae and Platypodidae) fauna of a country is directly dependent on that of its arboreal flora, and on the events which have determined the latter; hence the zoogeographical evidence provided by these beetles is of more limited application than that obtainable from insects whose environment is mainly soil or water. In the case of the pin-hole borers, migration between the islands of an archipelago by means of floating trees is probably a normal factor; provided that a tree floats without rotation, the development of the borers may continue for several months in the unsubmerged portion, and is not affected by occasional wash from waves.

Species that may have been introduced to Samoa by human agency are, e.g. *Thamnurgides myristicae* in nutmegs; *Cryphalus mangiferae* in mango plants; *Xyleborus confusus* in coconuts or rubber plants; *X. destruens* in cocoa plants and other trees; *X. morigerus* in mahogany and possibly in orchids; *X. kraatzi*, *X. semigranosus*, *X. submarginatus*, *X. affinis*, etc., in various softwoods. Other species of *Xyleborus*, as also *Platypus cupulatus* and *P. solidus*, have reached Australian ports alive in Malayan timbers, and should also be found in Samoa when the trade trends in that direction.

The holotypes of new species, unless otherwise stated, are in the British Museum.

PLATYPODIDAE.

1. *Crossotarsus externedentatus* Fairm.

Platypus externedentatus Fairm., *Rev. Mag. Zool.* (2), ii, p. 51 (♂), 1850.

Crossotarsus externedentatus Chap., *Monogr. Platyp.*, p. 81, fig. 20, 1865, ♂, ♀ (lege ♀, ♂).

Crossotarsus externedentatus Murayama, *Jl. Coll. Agr. Sapporo*, xv, p. 203, 1925.

Upolu: Apia, vii.1925; Malololelei, 25.iv., and v.1924, ex rotten trees.

Tutuila: Leone Road, 7.ix.1923, rotten bark (Swezey and Wilder); 24.iii.1926 (Judd).

Recorded from Hawaii Is., Tahiti, Fiji Is., Formosa. The known food-plants are *Acacia koa* on Oahu, *Spondias* sp. and *Inocarpus* sp. on Tahiti. Murayama records the species from *Carica papaya*, *Cinnamomum camphora*, *Cryptomeria japonica* and *Leucaena glauca* in Formosa.

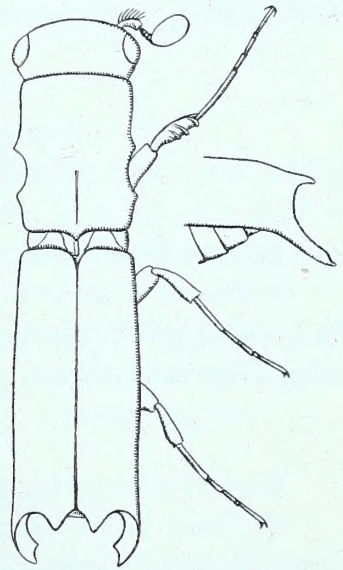
2. *Platypus tetracerus*, sp. n. (Text-fig. 1).

♂. Elongate, cylindrical, chestnut to piceous brown, with the head and elytral apex black.

Front flattened to level of eyes and slightly elevated over antennal bases, behind epistome smooth with a few piliferous punctures, elsewhere coarsely rugose with large variolose punctures bearing stiff recurved hairs; median line impressed opposite base of eyes.

Pronotum quadrangular oblong, 1.55×1.1 mm., finely smooth, shining, very sparsely finely punctate except in a dorsomedial strip; median line impressed from near base to centre of pronotum, and bordered by an irregular series of about 30 to 35 minute deep pores.

Elytra 3.2×1.2 mm., sides very faintly constricted just beyond base and before terminal impression, hence appreciably widened towards middle; finely lineate-punctate, punctures elongate, suture and 1st stria impressed throughout, 2nd to 5th striae impressed towards their bases; interspaces flat, smooth, impunctate, glabrous, but at a short distance from ante-apical edge coarsely multipunctate and pilose; posterior impression crescentic, deeply sulcate, its vertical height (from sutural angle to dorsum) one-fifth of its horizontal width, its dorsal edge carinate, interrupted at suture and projecting on each side opposite 2nd interspace in a horizontal subtriangular lobe, its lateral edge carinate, weakly serrate and continued to externoapical angles of elytra, which are prolonged in a narrow process curving downwards and inwards and obliquely truncate on inner edge at apex; fundus of impression brilliant, impunctate and concave to extreme ends of externo-apical processes; base (*i.e.* apical edge of elytra) of terminal emargination weakly incised at sutural angle, transverse, and curving into sides (*i.e.* inner edge of externo-apical process) in a different plane at less than a right angle; vestiture of short, stiff hairs, subseriate on interspaces just before posterior impression, on edges of the four processes, and along lateral margins of elytra in apical third.



TEXT-FIG. 1.—*Platypus tetracerus*, sp. n. ♂.

Last abdominal segment deeply concave, rugose-punctate.

♀ unknown.

Length : 5.2 mm. (head to tip of process).

Upolu : Malololelei, 2,000 ft., 18, 25.iv.1925, 23.xi.1924 (holotype).

All the four paratypes are without heads (paratype in Bishop Museum, Honolulu).

A member of the oriental group of *Platypi cupulati*, distinguished by the development of two dorsal accessory processes at the terminal impression.

SCOLYTIDAE.

3. *Hylesinus philippinensis* Eggers.

Zool. Meded., Leiden, vii, p. 137, 1923.

Upolu : Malololelei, 2,000 ft., vii., and 30.xi.1924 (2 ♀).

Known to occur in Java, the Philippine Is., New Guinea, Key Is., Fergusson Is. ; breeds like its allies in the bark of species of *Ficus*, its host in the Philippines being *Ficus benguetensis*.

4. *Hylesinus crassus*, sp. n.

Piceous black, with yellow vestiture.

♂. Front deeply impressed below eyes, sides elevated and carinate over antennal bases ; epistome straight, median line impunctate, shining ; sides of impression rugose-punctate, with a sparse vestiture of short, stiff setae ; upper level of eyes to vertex convex and closely rugulose-punctate.

Pronotum plano-convex, about 1.3 times as wide as long, sides uniformly curved from base to apex, without anterior constriction, but broadly transversely depressed in anterior third ; surface coarsely reticulate-punctate, walls of punctures narrow, carinate and confluent, but somewhat asperate towards sides ; median line carinate for a short distance ; apex with marginal asperities compressed into a feeble carina, anterior angle with three or four large recurved asperities, lateral margin without recurved asperities ; vestiture of short, stiff, lanceolate, semi-erect setae, interspersed with a few, shorter, finer ones.

Elytra twice as long as pronotum, and 1.3 times as long as wide, slightly divergent to beyond middle and then curved and strongly narrowed to apex, base carinate-tuberculate ; striae deep, with strong, round punctures ; interspaces not carinate nor appreciably convex, rather wider than striae, 2nd and

3rd wider than others dorsally, tuberculate irregularly but not transversely on dorsum and more evidently uniseriate at sides and declivity, tubercles small and round; ground-vestiture of minute, appressed setae, with larger, erect, lanceolate setae, for most part uniseriate, but irregular on basal half of first 3 or 4 interspaces.

Declivity with interspaces 4 to 6 and 8 shortened, 2, 3, and 7 less so, 9 carinate and joined with 1.

♀ unknown.

Length: 2.2 mm.

Upolu: Vailima, 13.ix.1925 (holotype).

Samoa: iii.-viii.1921 (O'Connor), 1 paratype (damaged).

Allied to *H. subcostatus* Eggers (Sumatra; Philippine Is.) in the elytral sculpture, but that species has the pronotal punctuation moderate and shallow, the apical margin laterally with only granules, and the whole lateral margin with strong tubercles.

The interspacial setae of *H. philippinensis* Eggers are shorter and obtuse, and the tuberculation is definitely transverse in the basal half of the elytra. The frontal impression is similar to that of the ♂ of *H. javanus* Eggers.

5. *Hylesinus pacificus*, sp. n. (Text-fig. 2).

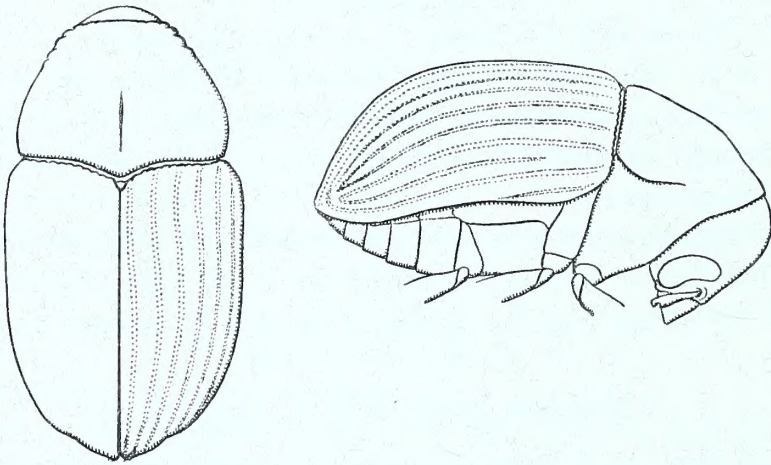
Brownish-black, with lower half of front, anterior region of pronotum and under surface dark ferruginous, with vestiture yellow and fuscous in ill-defined patches.

Front flattened, feebly transversely impressed in middle, produced laterally in a smooth callus over antennal bases, rugose-granulate between epistome and upper level of eyes, with a vestiture of fine, short, recumbent hairs; vertex convex, dull, finely alutaceous with weak punctures, glabrous; eyes emarginate to a depth of 2 facets.

Pronotum about 1.4 times as broad as long, base subtransverse, feebly bisinuate, obtusely produced opposite scutellum (much less so than in *laticollis* group), basal angles obtuse, sides curved and widest in posterior quarter, rather strongly narrowed to apical margin, which is broadly arcuate and bears a few weak granules, anterior angle with three large recurved asperities, sides without marginal asperities; anterior quarter transversely depressed, rugose-granulate, lateral region closely asperate, asperities obsolete before actual margin, dorso-

medial and postero-medial regions closely but not deeply rugose, rugae with a tendency to run parallel to elevated median line ; no oblique basal impression ; vestiture of short, stout, recumbent hairs, most evident laterally where they are directed caudad, and on either side of median line where they are directed transversely, elsewhere very sparse.

Elytra broader than pronotum at base, 2.1 times as long as pronotum and 1.4 times as long as their width in middle ; above plano-convex, declivity more steeply convex ; base tuberculate but not elevated, sides very broadly arcuate, apex narrowly rounded and slightly constricted ; striae narrow, impressed, with



TEXT-FIG. 2.—*Hylesinus pacificus*, sp. n. Dorsal and lateral.

punctures close, incised ; interspaces flat towards base, becoming narrower and convex towards declivity, obscurely tuberculate, tubercles small, irregularly three or four deep, feebly transverse towards basal margin, and rounder in apical two-thirds of elytra, becoming uniseriate on declivity ; sutural interspace rugose (not tuberculate) in basal half ; declivity with none of interspaces depressed, and 1st to 3rd joined with 9th ; vestiture of short, stout, recumbent hairs, similar to those of pronotum, with six to nine hairs across interspace ; on declivity these become smaller and squamiform, with one median series longer, setiform and elevated.

Abdomen convex longitudinally, but less so than declivity, sternites finely pubescent, last coarsely punctate.

Anterior tarsal joints 1 and 2 as broad as long, 3 bilobed and fringed beneath.
Length : 3.2 mm.

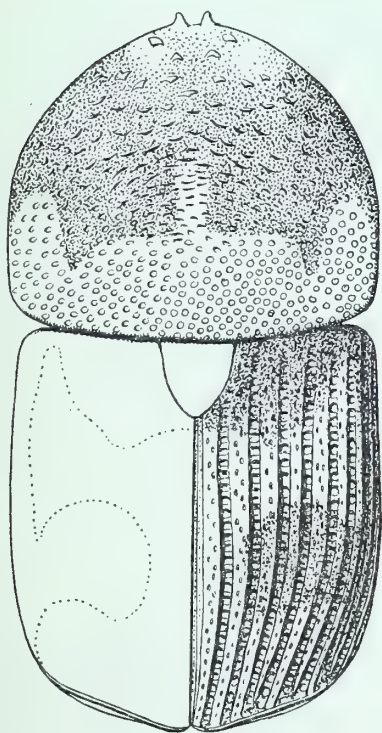
Savaii : Salailua, 22.v.1924 (Bryan) (1 specimen).
(Holotype in Bishop Museum, Honolulu.)

Distinct, owing to its sculpture and the proportions of the pronotum, from all species described from material from adjoining regions.

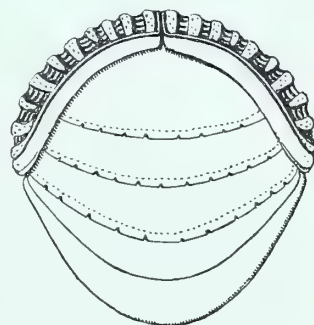
6. *Scolytomimus maculatus*, sp. n. (Text-figs. 3 and 4).

Testaceous or stramineous, with head, a patch on anterior half of pronotum limited behind by irregular lobes, basal quarter, lateral margin and a postmedian transverse band, from 3rd interspace to lateral band of each elytron, and metapleurum fuscous or black ; surface dull, finely coriaceous.

Front convex, strongly, closely rugose-punctate, each puncture with a fine, minute, appressed hair ; vertex and behind eyes brilliant, impunctate ; impressed behind epistome, which is fringed with long yellow hairs ; eyes deeply emarginate, lower portion larger. Antenna with funicle 6-jointed, joints 3 to 6 transverse, subequal ; club compressed, spongy, oval, $1\frac{1}{2}$ times as long as wide, with an oblique septum starting near base on each side and not meeting in middle.



TEXT-FIG. 3.—*Scolytomimus maculatus*, sp. n. Dorsal.



TEXT-FIG. 4.—*Scolytomimus maculatus*, sp. n.
Abdominal sternites.

Pronotum transverse, semiorbicular, strongly convex-gibbous, base margined and weakly bisinuate, basal angles (from side) obtuse, marginal carina not reaching middle of sides, apical edge with two large recurved teeth in middle

behind which are open rows of recurved, subtriangular asperities, becoming smaller, closer, and more numerous towards highest elevation and passing into large, round, shallow, punctures behind middle and towards sides; vestiture of scarcely visible, fine, appressed hairs longer on apical margin. Scutellum very large, subtriangular.

Elytra subquadrate, $1\frac{1}{4}$ times as long as pronotum, sides parallel for about four-fifths and thence oblique and slightly sinuate to sutural angle, above depressed, weakly plano-convex from scutellum to apex; striate-punctate; punctures large, close, impressed and laterally somewhat quadrate; interspaces wider than striae, flat, slightly elevated towards apices (appearing convex in immature individuals), irregularly biseriate-punctate, 4th, 6th and 8th a little narrower and almost uniseriate-punctate, 9th elevated and continued as a carina to sutural angle, leaving a sulcus between it and apical edge of elytron.

Abdomen strongly ascending, last three segments coarsely punctate and transversely impressed, posterior margins of 2nd, 3rd and 4th carinate and armed with a series of isolated acute denticles (as in text-figure); sides and apex of 5th segment carinate, without teeth.

Length: 1.6 to 1.8 mm.

Upolu: Apia, xii.1924; Vailima, i.1925 (holotype), 24.v.1924; Malololelei, iv.1924.

Tutuila: Leone Road, 24.iii.1926 (Judd), 7.ix.1923 (Swezey and Wilder).
(Paratypes in Bishop Museum, Honolulu.)

Differs from the only other species in this genus, *S. dilutus* Bldfd. (Ceylon) in the abdominal armature.

7. *Cryphalus samoensis*, sp. n. (Text-fig. 5).

Broadly oval, fuscous-testaceous.

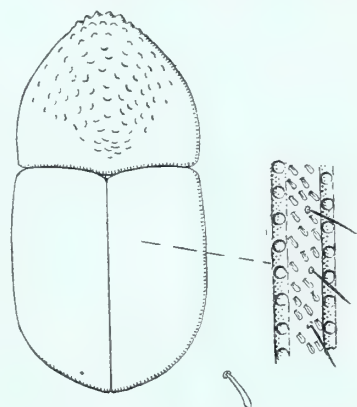
♂. Head with epistome arcuately emarginate.

Front convex, moderately shining, with a few small punctures, slightly elevated in middle in a brilliantly shining boss (which in case of type shows blue opalescence), posterior half of front deeply impressed, with a transverse shining rounded carina forming its anterior margin.

Prothorax very slightly broader than long ($\times 1.1$), base transverse, very feebly sinuate, margined, sides rounded in basal half and strongly narrowed from middle to apex, which bears four prominent, contiguous asperities, with

one less evident on either side; pronotal asperities (as in figure) covering about four-fifths (which is strongly declivous), fairly uniform in size, remote, interspersed with minute granules, basal border and sides granulate, and near basal angle coriaceous, dull; basal angles—seen from side—rounded and margined.

Elytra shining, about a fifth longer than broad; scutellum minute; bases separately rounded; sides subparallel to posterior third, thence rounded to apex; slightly flattened and rugose along suture at base, rather steeply declivous at apex; distinctly striate-punctate, striae feebly impressed, their punctures circular and distant by about diameter width; interspaces smooth, weakly rugulose, punctate at bases, with a ground-vestiture of minute scales, multi-seriate, and a single series of erect dark setae, which are much shorter, and broadened and decumbent on declivity (figure shows portion of dorsal interspace and striae, and one seta from declivity); interspaces on declivity convex and narrowed in upper part, but flattening out before elytral margin, without granules or tubercles.



TEXT-FIG. 5.—*Cryphalus samoensis*, sp. n. ♂, and elytral details.

Length: 1.5×0.75 mm.

♀. Front convex, impressed and tuberculate-punctate behind epistome on either side of a short median carina, which expands into a broad shining impunctate area in middle of front; rest very finely coriaceous, with scattered punctures.

Prothorax semioval, very slightly broader than long ($\times 1.1$), less constricted anteriorly than in ♂, sides gradually rounded and narrowed into apical margin, which bears four distinct asperities, with two more obsolete on either side; patch of pronotal asperities less strongly declivous than in ♂, asperities occasionally contiguous; declivity rather less steep than in ♂, and 3rd interspace still elevated at apical margin.

Length: 1.5×0.75 mm.

Upolu: Malololelei, v.1924, from rotten trees. Holotype ♂ and allotype ♀, same data. A third specimen, crushed, with same data.

Allied to *C. inops* Eichh. (Guadeloupe) and *C. submuricatus* Eichh. (Burma); the prothorax of the former is described as ovate, slightly constricted at the

base, and the sutural stria as uniformly impressed from base to apex ; the latter species has the interspaces " submuricate-scribulate " at the bases, and " sub-tuberculate " towards the apices. Probably assignable to *Ericryphalus* Hopk.

8. *Cryphalus* sp. n.

An oblong-oval testaceous species with thorax 1.2 times as broad as long, not constricted, apical margin with four teeth, basal angles (from side) rounded. Elytra cylindrical, parallel-sided, 1.3 times as long as broad, and 1.7 times as long as prothorax ; striae not evident ; interspaces with ground-vestiture of small scales and a series of short, fine, erect setae, which are broadened or squamiform on declivity.

Length : 1.05 mm.

Legs, antennae and front concealed. One specimen immature. Apparently allied to *C. minimus* Eggers (Philippine Is.).

Savaii : Safune, 14.vi.1924 (Bryan).

9. *Cryphalus* sp.

Apparently a true *Cryphalus* with 4-jointed funicle, emarginate 3rd tarsal joint, and interspatial setae long.

One specimen, crushed, about 1.4 mm. long.

Tutuila : Afono Trail, 25.ix.1923 (Swezey and Wilder).

10. *Cryphalus* (*Hypocryphalus*) *mangiferae* Stebb.

Cryphalus (*Hypothenemus*) *mangiferae* Stebb., *Indian Forest Insects*, p. 542, fig. 349, 1914.

Dacryphalus (*Cryphalus*) *mangiferae* Hopk., *Bull. Entom. Res.*, xviii, p. 28, 1927.

Upolu : Apia, vii.1924, from mango, a series.

This beetle occurs in mango bark in India and Burma, and was first collected at Dehra Dun in 1902 ; but no specimens have been recorded from the Malay Region, where it must undoubtedly accompany *Mangifera indica*. Sampson assigned this species to *Dacryphalus* Hopk. for reasons that are not evident, as its antennal characters agree better with those of *Hypocryphalus* Hopk.

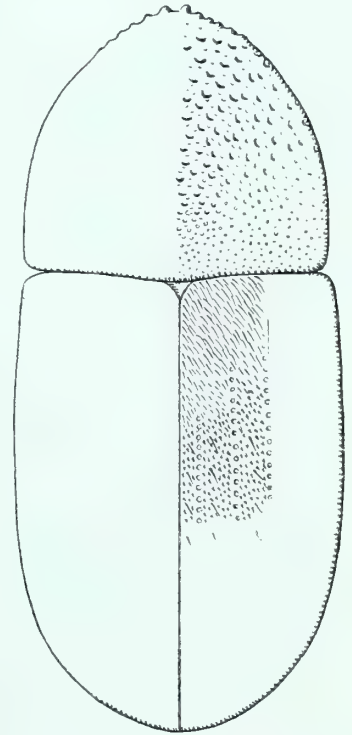
11. *Cryphalus* (*Hypocryphalus*) *basihirtus*, sp. n. (Text-fig 6).

Brown, sides, under-surface and head infusate.

Front flattened, moderately shining, very finely aciculate-granulate, with sharply carinate median line; vestiture sparse, of long, fine, erect hairs.

Antennal funicle 5-jointed, sutures of club straight. Pronotum semiovalate, slightly broader than long, margined along transverse base and half-way up sides, which are subparallel in basal third, and gradually curved and narrowed to apex; apical margin with two large, median, recurved asperities, flanked by three or four much smaller ones; anterior area with asperities small, flattened, sparse, and irregular, interspersed with small granules, and becoming smaller laterally and posteriorly, and passing without definite demarcation into sculpture of rest of pronotum, which consists of small, obtuse granules, that flatten out and disappear towards basal angles; latter (seen from side) are broadly rounded; vestiture of long, upstanding hairs on lateral and apical margins, and of fine recumbent hairs on granulate area.

Elytra as long as broad and as long as pronotum, sides subparallel to posterior third, apex uniformly arcuate, dorsum plano-convex and passing insensibly into gentle curve of declivity; carinate-marginate between raised humerus and basal angle, and along lateral edge, becoming retuse-sulcate along apical edge; suture flush with general surface throughout; sculpture finely rugulose except near basal angle, where it is subgranulate, otherwise whole surface flat, very finely, irregularly punctate, at about four to five punctures across interspatial width; striae scarcely traceable except by slightly larger, uniseriate punctures; vestiture consisting of (a) ground-pubescence of narrow, minute, grey, appressed scales arising from the punctures; these are replaced by very fine, short, semi-erect hairs in basal quarter and along lateral border; (b) slightly longer, dark, erect, setiform hairs in a single series on each interspace.



TEXT-FIG. 6.—*Cryphalus*
(*Hypocryphalus*) *basihirtus*,
sp. n. Dorsal.

Anterior tarsus with 3rd joint stout, cordate and fringed with long barbed hairs.

Length : 2.4 mm.

Upolu : Malololelei, iv.1924 (2 specimens).

Distinguished from other members of the group *Cryphalus* (s.l.) by the pronotal sculpture and peculiar elytral vestiture.

12. *Thamnurgides myristicae* Roepke.

Roepke, *Treubia*, i, p. 23, f. 1-7, 1919.

Upolu : Malololelei, 24.ii.1924 (1 specimen).

Tutuila : Fagasa, 9.ix.1923, nutmeg tree (Swezey and Wilder) : a series.

Recorded from Salatiga, Java, as breeding in fallen nutmegs. I have seen specimens from Ceylon, Penang, and Sumatra.

Roepke describes the prothorax as " ganz gleichmässig fein, dicht und seicht punktiert, die Punktierung nur in vorderem Region ein wenig grösser " ; the pronotal surface is, however, covered uniformly and fairly closely with small rounded granules except on the median line basally, which is punctate ; interspersed, particularly in the anterior third, are a few much larger granules.

Thamnurgides sundaensis Eggers (1923) is not separable from *T. myristicae* by the description.

13. *Thamnurgides vulgaris* Eggers.

Dendrurgus vulgaris Eggers, *Zool. Meded.*, Leiden, vii, p. 151, 1923.

Upolu : Malololelei, 2,000 ft., 30.xi.1924 (1 specimen).

Tutuila : Fagasa, 9.ix.1925, rotten bark (Swezey and Wilder), 1 specimen.
Ranges from Tenasserim to New Guinea.

14. *Thamnurgides setosus*, sp. n.

Testaceous to chestnut-brown, with thorax darker, shining. Front with fine carinulae diverging from middle of epistome, median line elevated to beyond upper level of eyes, and laterally a few punctures ; vestiture sparse, of fine, short, recumbent hairs, and very long, erect ones.

Pronotum about as long as broad in middle (0.65 mm.), base transverse, not evidently margined, basal angles obtuse, sides divergent and margined to just behind middle, thence curved and strongly narrowed to apex, which is transverse and separately curved ; plano-convex, smooth, shining, with sparse

punctures interspersed with granulate punctures, latter piliferous, hairs at sides of prothorax much longer than those on elytra.

Elytra wider than pronotum at base (about 0.7 mm.), and 1.6 to 1.7 times as long as pronotum, sides parallel to behind middle and then narrowed and broadly rounded to apex, which is slightly extended downwards; above cylindrical, gently declivous in a uniform convexity from about middle, declivity not flattened, suture not raised, and the two or three striae very weakly impressed towards their apices. Striae regular, with large close punctures, not impressed, without strial hairs. Interspaces flat, narrow, finely uniseriate-punctate (or at most very weakly granulate-punctate), punctures about two-thirds as numerous as those of striae; interspatial vestiture consisting of long, fine, erect hairs laterally and near base, and changing gradually into thicker setae with widened ends on and above declivity.

Anterior tibia with four teeth (in addition to apical spur).

Length: 1.55 to 1.6 mm.

Tutuila: Fagasa, 9.ix.1923, rotten bark (Swezey and Wilder), a short series. (Paratypes in Bishop Museum, Honolulu.)

Closely allied to (and possibly identical with) *T. persicae* Hopk. (the genotype) and *T. minor* Eggers, of which I have seen only the descriptions. *T. persicae*, which was found in Honolulu in imported peach trees, is described as having the pronotum "faintly and sparsely punctured but without rugosities," and *T. minor* (Java and New Guinea) has "Punktkörnchen" present only on the front of the pronotum. Both are said to have hairs, instead of setae with evidently widened subspatulate ends, on the declivity.

15. *Thamnurgides tutuilensis*, sp. n.

Testaceous to ferruginous brown.

Front with fine irregular carinulae diverging from middle of epistome, and breaking up into elongate granules and punctures; median line carinate below, smooth and elevated nearly to vertex, which is brilliant and almost impunctate; vestiture sparse, of long, erect hairs, with a few short, recumbent ones.

Pronotum plano-convex, as broad as long (of same outline as in *T. philippinensis*), smooth, shining, with granulate punctures scattered remotely over entire surface, granules variable in size, weak along anterior border, and bearing fine erect hairs of variable length; basal angles obtusely rounded and

margined ; sides margined to middle, broadly curved, much narrowed in apical half ; apex curved, less transverse and wider than in *T. setosus*.

Elytra slightly wider than, and 1.6 times as long as, pronotum, not quite 1.5 times as long as wide, subparallel to behind middle, thence broadly curved to apex, cylindrical to well beyond middle ; declivity rather steeply convex, not flattened ; regularly striate-punctate, punctures large, fairly close, without hairs, striae weakly impressed and more evidently so on declivity ; interspaces flat, subrugulose, uniformly uniseriate granulate, granules minute, bearing long, fine, erect hairs from base to apex, distant (as in *T. philippinensis*) at rate of about 7 granules to 9 or 10 strial punctures on dorsum, and closer on declivity.

Anterior tibia with four teeth (not including apical spur).

Length : 1.85 to 2.05 mm.

Tutuila : Fagasa, 9.ix.1923, rotten bark (Swezey and Wilder) : a short series. (Paratypes in Bishop Museum, Honolulu.)

Closely allied to *T. philippinensis* Eggers (Luzon ; New Guinea), but relatively narrower, the pronotum more depressed and less closely granulate (approaching the sculpture of *T. ternatensis* Eggers : Sumatra, Ternate), the declivity more convex and less abrupt.

16. *Thamnurgides cyperi*, sp. n.

Varying from wholly ferruginous to thorax black, elytra and under surface dark chestnut, legs light brown.

Front with numerous fine, divergent carinulae extending from epistome to beyond eyes, median line a strong carina beginning shortly behind epistome and broadening ; sparse vestiture of long, erect, and short, recumbent hairs.

Pronotum as long as broad, plano-convex, broadly oval, with highest elevation just before base, which thus appears transversely depressed ; basal angles obtusely rounded, base not evidently margined (in mature individuals finely rugulose), sides margined in basal third and curved from base to apex, slightly narrowed apically but not produced ; anteriorly with close (but not contiguous) coarse, subtriangular asperities, which become narrower and more elongate towards sides, and smaller and flatter, interspersed with granulate punctures in basal third ; a smooth, impunctate median line from near base to middle ; vestiture of long, erect and short, recumbent hairs intermixed.

Elytra slightly broader than, and 1.6 times as long as pronotum, 1.5 times

as long as broad, cylindrical, sides parallel to apical third, thence broadly curved ; apex slightly acuminate ; stria punctures small, shallow, distant by more than a diameter, without hairs, interspaces flat, uniformly uniseriate-granulate, granules distant at 10 to 14 or 15 stria punctures, bearing long, erect, stout, yellow hairs ; above flat to well behind middle, thence convex, declivity rather steep, not flattened, with first stria evidently impressed, 2nd less so and punctures rather larger and deeper than dorsally.

Anterior tibia with four teeth (in addition to apical spur).

Length : 1.95 to 2.25 mm.

Upolu : Apia, 13.ix.1923, on sedge (Swezey and Wilder) : a short series. (Paratypes in Bishop Museum, Honolulu.)

Distinguished from other species of *Thamnurgides* by the development of the asperities on the pronotum, which recall those in some *Dryocoetes*.

17. *Pelicerus brevior* Eggers.

Philipp. Journ. Sci., xxxiii, p. 86, 1927.

Upolu : Apia, iii., xi., xii.1924 ; Vailima, 3.vi.1924 (both sexes).

Described from specimens from Masbate, Luzon, and Mindanao, Philippine Is.

The form of the prothorax, which is about 1.1 times as long as broad, varies from parallel-sided to narrowed from the base ; as regards the ratio between the length and the breadth of the prothorax, the cotypes before me also differ from the original description. The frontal and epistomal hairs of the male are finely barbed.

18. *Pelicerus granulifer*, sp. n.

Ferruginous brown, shining, cylindrical.

♀. Front feebly convex, shining, moderately strongly punctate, with sparse, long, erect hairs.

Pronotum very little (1.06) longer than broad, narrowed and rounded from well behind middle, anterior half with flat asperities, becoming obsolete in posterior half, which is strongly punctate, punctures on dorsum and sides subtriangular, and towards basal angles sub-circular ; no middle line.

Elytra as broad as and 1.5 times as long as pronotum, cylindrical, sides parallel and very broadly rounded in apical quarter ; declivity steep, convex

above and somewhat flattened in lower two-thirds, lateral and apical margins rounded, not carinate, and without tubercles ; strial punctures close, moderately large, those in 1st stria larger, 1st stria impressed throughout ; interspaces narrow, not quite flat, 1st and 2nd from near middle, 3rd and 4th from further behind middle with alternate or third punctures larger, subgranulate, all four interspaces with evident granules before top of declivity ; all interspaces on declivity with a series of small tubercles, 1st and 2nd with a tubercle at site of every second or third puncture, 3rd and 4th with tubercles smaller and closer ; all striae impressed on declivity, and sutural interspace raised.

Vestiture of long stiff hairs from tubercles and subgranulate punctures, and of microscopic cross-hairs in strial punctures.

♂ unknown.

Length : 2.1 to 2.3 mm.

Tutuila : Pago Pago, 0 to 300 ft., iv.1918 (Kellers), 3 specimens. (Paratype in Bishop Museum, Honolulu.)

Of the three species described from specimens from New Guinea, *P. orientalis* Eggers and *P. papuanus* Eggers are distinguishable by the proportions of the prothorax and elytra, and by the sharply marked apical margin of the elytra ; *P. minor* Eggers is distinguished by its size and by its convex declivity.

19. *Pelicerus* (?) *grandis*, sp. n.

Front flat, shining, with close, fine punctures, sparser towards middle line, bearing erect yellow hairs, short in middle of front, but much longer and minutely barbed at sides, each hair dilated at base and lying flat on frontal surface before turning abruptly perpendicular to it, producing effect of a squamose ground-pubescence ; epistome emarginate in middle, with a fringe of long, yellow, minutely barbed hairs. Antenna with 5-jointed funicle, and club compressed, circular, its anterior face almost wholly pubescent except for basal corneous area, which is limited by a procurved suture scarcely reaching one-third of diameter, its posterior face with corneous area occupying more than two-thirds, limited by a broadly procurved, pubescent suture near apical margin.

Pronotum as broad as long (1.8 mm.), base broadly arcuate, basal angles rounded, sides converging and nearly straight to anterior third, then broadly curved and narrowed to apex ; anteriorly and laterally to beyond middle, with low asperities without evident punctures, medio-dorsally with asperities flattened

out and imbricate, not concealing punctures, posterior region more evidently punctate except along basal border, which is irregularly rugose-asperate ; median line faint ; vestiture of scattered, erect hairs and an almost invisible sparse ground-pubescence.

Elytra as broad as pronotum at base, and 1.6 times as long as pronotum, cylindrical as far as apical sixth and then very broadly rounded ; declivity steep, flattened, with 2nd and 3rd interspaces depressed, 1st widened and elevated towards apex ; striae almost as wide as interspaces, all rather strongly and uniformly impressed, punctures very large, round and moderately deep, distant by a third of diameter or less ; interspaces flat, smooth, rather closely and finely punctate (punctures very much smaller than those of striae), 7th towards declivity, 5th and 3rd confusedly punctate (in places irregularly biseriate), rest uniseriate-punctate, and 2nd from about middle and 1st from near base with every 3rd or 4th puncture replaced by a weak granule ; all interspaces from top of declivity to apical margin with a series of small tubercles, closer (every other puncture) in upper part of declivity ; vestiture—granules, tubercles, all interspaces before declivity, 9th and 10th wholly, with erect stiff, yellow hairs.

Length : 4.7 mm.

Upolu : Malololelei, 24.ii. (holotype) and 14–30.vi.1924 (1 paratype).

In spite of its deceptive resemblance to a large *Dryocoetes*, this species is excluded by its antennal characters from any of the sections of that genus defined by Hopkins.

20. *Dryocoetes samoanus* Eggers.

Ent. Blatt., xxiv, p. 174, 1928.

Apia : (Friedrichs).

Not represented in the present collection.

21. *Xyleborus morigerus* Bldfd. ?

Xyleborus morigerus Bldfd., *Insect Life*, vi, p. 260, 1894.

Xyleborus coffeae Wurth., *Meded. v. h. algem. Proefst. op Java* (2), no. 3, pp. 63–78, 1908.

Xylosandrus morigerus Reitt., *Bestimm.-tab. Eur. Scol.*, p. 84, 1913.

One specimen (much crushed) from Upolu : Malololelei, v., appears to belong to this species.

X. morigerus was first described from specimens imported in New Guinea orchids, and has since been found in Vienna, Rome, Marseilles, and England.

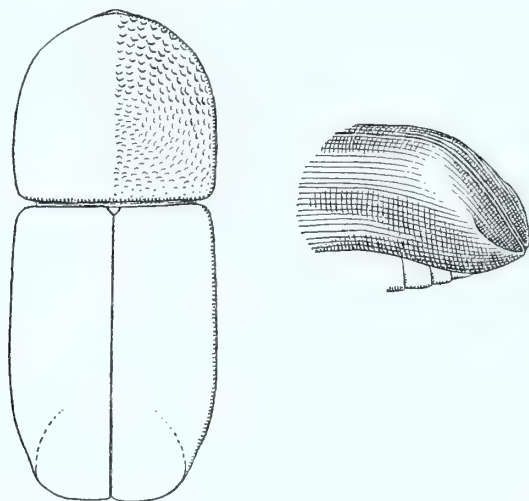
In the East it is known to occur in Ceylon, Java, Philippines, and New Guinea, as a borer in the shoots of coffee, cocoa, *Crotolaria anagyroides*, *Leucaena glauca*, *Swietenia mahagoni*, *S. macrophylla*, *Tectona grandis*, and *Tephrosia*.

22. *Xyleborus swezeyi*, sp. n. (Text.-fig. 7).

Dark chestnut, appearing almost glabrous.

♀. Front rugose-punctate immediately behind epistome, rest concealed.

Pronotum globose, as broad as long, moderately shining, with a coriaceous surface, base transverse, basal angles rounded, sides very feebly arcuate, apical



TEXT-FIG. 7.—*Xyleborus swezeyi*, sp. n. ♀, dorsal and declivity.

margin uniformly arcuate, but slightly produced in middle owing to asperities of extreme edge coalescing into a carina, behind which is a marginal sulcus; anterior asperities low, wide, fairly dense, becoming smaller at middle and beyond, and becoming flattened subimbricate rugae posteriorly; postero-lateral area smooth, sparsely punctate; basal border narrowly punctate; vestiture of long hairs at sides, and inconspicuous recumbent hairs among asperities. Scutellum semi-oval.

Elytra 1.5 times as long as pronotum, rather depressed, plano-convex from scutellum to middle of dorsum, sides very slightly divergent to behind middle,

thence narrowed and feebly constricted before apex, which is transverse; declivity oblique, beginning well behind middle, flattened in lower part as far as 4th stria, declivital margin at apex and to half-way up sides distinctly acute, elsewhere rounded into sides and dorsum of elytra; striae with large, somewhat impressed punctures, sutural stria more impressed throughout; interspaces flat, smooth, with much smaller and weaker punctures, those of 1st interspace still finer and closer, all rather irregularly uniseriate and then irregularly multiseriate just before declivity, except 5th, which is irregularly biseriate from base and uniseriate before declivity; on face of declivity all interspaces flat, rugulose and very finely, irregularly punctate; striae punctures as large as on dorsum.

Length : 3.2 to 3.3 mm.

♂ unknown.

Tutuila : Fagasa, 9.ix.1923, rotten bark (Swezey and Wilder), 2 specimens. (Holotype in Bishop Museum, Honolulu.)

Allied to *X. insulindicus* Eggers (New Guinea), and *X. similis* Eggers (Philippine Is.), but differing in punctuation and the form of the declivity.

23. *Xyleborus wilderi*, sp. n.

♀. Cylindrical, robust, declivity oblique and tuberculate, ferruginous-brown to piceous-brown.

Front convex, elevated in middle and feebly transversely impressed at level of upper margins of eyes, coriaceous, moderately shining, with numerous large and small rugulose punctures.

Pronotum about $1\frac{1}{2}$ times as long as broad, base transverse, basal angles obtusely rounded, sides parallel to well before middle, apex narrowly rounded, rising steeply in apical third, which is covered closely with triangular asperities, these prominent on apical margin, ceasing before middle and not extending laterally, remaining part (nearly two-thirds) cylindrical, its surface moderately shining, faintly coriaceous, fairly closely punctate, punctures large, interspersed with much smaller ones; median line not evident.

Elytra $1\frac{1}{2}$ times as long as prothorax, parallel-sided and cylindrical for about two-thirds of their length, then curved to broadly rounded apex, declivity oblique and flattened; regularly striate-punctate throughout, punctures round, incised, distant by about their diameters, 1st and 2nd striae impressed, 3rd more

feebly and rest scarcely perceptibly; interspaces shining, subrugulose, more finely and nearly as abundantly punctate as striae, dorsal ones subconvex, 3rd, 2nd, and 1st for increasing distances from declivital margin with alternate punctures replaced by granules.

Declivity oblique, flattened, its dorsal and lateral boundaries rounded, apical margin carinate; sutural interspace flat, smooth, shining, depressed before beginning of declivity, slightly broadened and elevated on declivity, its alternate punctures minutely granulate; 1st stria impressed except near apex; 2nd interspace elevated in its upper part, much widened from beginning of declivity and narrowed rapidly at apex, with three sharp conical tubercles of variable relative size, 1st situated at summit of declivity, 3rd half-way down and 2nd nearer 1st, rest of interspace with one or two minute granules (*N.B.*—In one paratype the 1st tubercle is feebly developed, in the other paratype the 1st is reduced to a granule, and there is an additional tubercle between the 2nd and 3rd); 3rd stria and 3rd interspace strongly curved outwards, latter narrow, with three or four small tubercles.

Pilosity: sides and apical half of prothorax, large punctures of basal half, interspatial punctures and tubercles throughout with pale erect hairs, longer on lateral and declivital areas than on dorsum.

Length: 2.75 mm.

♂ unknown.

Tutuila: Fagasa, 9.ix.1923, rotten bark; Pago Pago, 9.ix.1923 (Swezey and Wilder), 3 specimens. (Paratype in Bishop Museum, Honolulu.)

A somewhat isolated species, distinguished by the widened and tuberculate 2nd interspace. In the form of the elytra and the declivity it approaches *X. asperatus* Bldfd. (Ceylon), which has a quite different type of pronotum.

24. *Xyleborus semigranosus* Bldfd.

Xyleborus semigranosus Bldfd., *Tr. Ent. Soc. Lond.*, 1896, p. 211, 1896.

Dryocoetes bengalensis Stebb., *Ind. For. Mem.*, Zool., I, i, p. 12, 1908.

Xyleborus mascarenius Haged., *Deutsche ent. Zeitschr.*, Jahrg. 1908, p. 379, 1908.

Upolu: Apia; Vailima, i.1925 (2 specimens).

Previously known to occur in East Africa, Seychelles, Mauritius, Ceylon, India, Burma, Sumatra, Mentawai, Java. Imported into Paris in tobacco bales from Sumatra; in India it breeds in several species of trees, including exotics.

25. *Xyleborus samoensis*, sp. n. (Text-fig. 8).

♀. Dark piceous brown to black.

Front subconvex, very finely coriaceous, narrowly impressed behind epistome on each side of a short median line, expanding in centre into a smooth, shining space; a few piliferous punctures of irregular size in oral third.

Pronotum oblong-quadrangular (as in *X. indicus* Eichh.), 1·2 times as long as broad, basal angles obtusely rounded, sides almost straight, apical margin transverse, apical angles broadly rounded; above slightly convex, anterior asperities obsolete before strong central umbonation, postero-dorsally and most of sides subnitid, faintly coriaceous, with minute, scarcely visible punctulation.

Elytra 1·5 to 1·6 times as long as pronotum, sides straight to beyond middle, thence feebly narrowed, and in apical fifth abruptly inflexed, apical margin subsinuate; striate-punctate, punctures uniform, close, dorsal striae

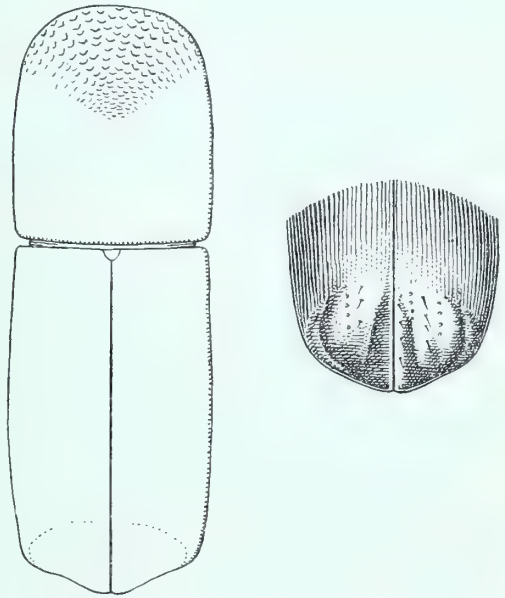
distinctly impressed except at base; interspaces flat, shining, in basal half remotely punctate (at 6th to 8th strial punctures), towards declivity punctures closer, becoming granules; weakly convex from elytral base to summit of declivity, which is oblique and begins in apical fourth, flattened in a broad-oval, its apico-lateral margin acute between 2nd and 7th interspaces; on declivital face, 1st interspace elevated throughout and gradually widened to apex, serio-granulate, 2nd flat and granulate, but raised at extreme apex in conjunction with 1st, 3rd granulate, subconvex externally owing to impressed 3rd stria, 4th to 7th confluent and raised, forming margin of declivity.

All interspatial punctures and granules with short stiff hairs.

Length: 2·45 to 2·5 mm.

♂ unknown.

Samoa: 1920 (Swale); holotype.



TEXT-FIG. 8.—*Xyleborus samoensis*, sp. n.
♀, dorsal and declivity.

Upolu : Leulomoega, 14.ix.1923 (Swezey and Wilder).

Savaii : Salailua, 21.v.1924 (Bryan).

One specimen from each locality.

(Paratype in Bishop Museum, Honolulu.)

Allied to *X. indicus* Eichh. (E. Africa to New Guinea), from which it is distinguishable by the impressed striae and the structure of the declivity.

26. *Xyleborus bicolor*, Bldfd. *unimodus*, subsp. n.

♀. Cylindrical, shining, dark brown or somewhat piceous, almost glabrous.

Front finely reticulate, dull, with a few large punctures near each eye, and over middle of epistome.

Pronotum nearly 1.2 times as long as broad, base transverse, basal angles obtusely rounded, sides very feebly arcuate, and divergent to well in front of middle, apex subacuminately rounded; anterior region closely asperate and declivous from just in front of centre, posterior surface somewhat depressed, shining, smooth, sparsely and exceedingly finely punctulate; median line not evident. Scutellum rounded, shining.

Elytra as wide as pronotum at base, and 1.5 times as long as pronotum, basal angles subrectilinear, sides parallel for three-fourths of length, apex circularly rounded and slightly emarginate at sutural angle (less so than in *X. laevis*), apicolateral margin of declivity acutely retuse-carinate; above slightly depressed in basal half, declivous from about middle in a gentle convexity, slope of apical portion of declivity more oblique than in typical *X. bicolor*; finely lineate-punctate, interspaces flat, with much smaller and finer punctures in a remote series; on declivity interspaces one and three elevated, 1st with five or six fine piliferous tubercles, 3rd with same number smaller, 5th with fewer; striae punctures large and strong, obliterating 2nd and 4th interspaces.

♂ unknown.

Length : 1.9 to 1.95 mm.

Tutuila : Pago Pago, 21.ix.1923, rotten bark (Swezey and Wilder), 4 specimens.

(Paratypes in Bishop Museum, Honolulu.)

Closely resembling specimens from Assam and Bengal, identified by the late Lt.-Col. Sampson as *X. bicolor* Bldfd. (Japan), differing only in the uniform coloration, the slightly more oblique declivity and the stronger development of the tubercles on the sutural interspace; possibly a local form of the Japanese species.

Sampson has described (*Ann. Mag. Nat. Hist.*, (9) xi, p. 289, 1923), under the name *Xyleborus bicolor* Bldfd., var. *a*, a form collected by me in the Sunderbans; this is in my opinion a distinct species, which should be known as *Xyleborus alpha*. The description states "the first and second interstices tuberculate and setose"; first and third were presumably intended.

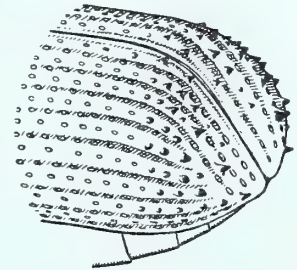
27. *Xyleborus artelineatus*, sp. n. (Text-fig. 9).

♀. Head and prothorax piceous-black, elytra piceous-brown, legs testaceous.

Front convex, dull, minutely reticulate-alutaceous, with sparse, large punctures bearing long hairs; median line elevated.

Pronotum about 1.1 times as long as broad, sides parallel from rounded basal angles to in front of middle, apex broadly arcuate; anterior region with flattened, close rugosities terminating abruptly before middle in a weak transverse elevation, posterior region and sides minutely reticulate-alutaceous, dull, very finely and sparsely punctulate; long hairs in asperate area, very short ones elsewhere. Scutellum a conical tubercle almost concealed by stiff, yellow hairs at base of pronotum.

Elytra cylindrical, as broad as, and 1.5 times as long as, pronotum, base truncate, posterior angles straight, sides parallel for more than two-thirds, apex broadly rounded, subretuse, declivity steep, moderately impressed; striae with punctures large, close, scarcely impressed; interspaces flat, shining, uniseriate-punctate; punctures not quite so close or so large as those of striae, dorsal interspaces not tuberculate until just before summit of declivity; sides and summit of declivity rounded, with fairly close, large, conical tubercles; 1st interspace with two or three tubercles at summit and upper quarter, flat and subrugulose below; 2nd interspace with large tubercles near summit and smaller granules in middle section, immune towards apex; 3rd interspace tuberculate throughout, two in middle section being largest and one at apex being very prominent; 4th to 6th interspaces with smaller tubercles; 1st to 3rd striae slightly impressed and punctures obsolete; vestiture from base to apex of long, erect hairs on interspaces (longer on tubercles), and short, semi-recumbent hairs on striae.



TEXT-FIG. 9. — *Xyleborus artelineatus*, sp. n. ♀, declivity.

Length : 2.25 mm.

♂ unknown.

Upolu : Malololelei, v.1924, from rotten trees (2 specimens).

Closely allied to *X. artestriatus* Eichh. (Burma to Borneo), and *X. angustior* Eggers (Tenasserim), but differing in the presence of small tubercles on the second interspace of the declivity, and their absence on the dorsum before the declivity ; narrower than *X. artestriatus*, in which the elytra are 1.3 times as long as the pronotum ; and shorter in the pronotum than *X. angustior*, in which the pronotum is nearly twice as long as broad.

28. *Xyleborus destruens* Bldfd.

Xyleborus destruens Bldfd., *Tr. Ent. Soc. Lond.*, p. 221, 1896.

Upolu : Malololelei, 2,000 ft., vi. and 28.xi.1924.

Savaii : Safune, rain forest, 2,000 to 4,000 ft., 9.v.1924 (Bryan).

Previously recorded from Java and Gilolo. I have seen specimens in the Genoa Museum (Eggers det.) from Engano Is., Ternate and New Guinea. The species is known as a borer of diseased cacao trees and of teak saplings in Java.

The Samoan specimens are small (4.5 mm.), and have the pronotum straighter at the sides than in specimens from Java.

29. *Xyleborus kraatzi* Eichh.

Xyleborus kraatzi Eichh., *Berl. ent. Zeitschr.*, xii, p. 152, 1868.

Xyleborus perforans Bldfd., 1893, *et auct.*, nec Wollaston, 1857.

Xyleborus immaturus Blackburn, *Tr. Roy. Soc. Dublin*, iii, p. 193, 1885. [New syn.]

Tutuila : Leone Road ; Fagasa, rotten bark (Swezey and Wilder) ; Pago Pago, 0 to 300 ft. (Kellers).

Savaii : Safune, rain forest, 2,000 to 4,000 ft. (Bryan).

Upolu : Apia ; Vailima ; Mt. Vaea, 1,500 ft. ; Malololelei, 2,000 ft.

Samoa : (Swale ; Friedrichs).

Taken in every month but vii., viii., and x.

In 1893, in his *Report on the destruction of Beer-casks in India*, Appendix, p. 46, Blandford identified *Xyleborus kraatzi* Eichh. (Ceylon) with *X. perforans* Woll. (Madeira), and in 1898 (*Biol. Centr.-Amer.*, Col. iv, p. 216) reiterated his opinion that broadly speaking *X. perforans* Woll. could be recognised as a

palaeotropical species, and *X. affinis* Eichh. as a neotropical species. Blandford's synonymy has recently been questioned by Eggers (*Sbornik ent. Mus. Praze*, iii, p. 154, 1925; and *Treubia*, vii, p. 301, 1926), who states that *X. kraatzi* Eichh. should not be treated as identical with *X. perforans* Woll., "da die Indomalayenform im africanischen Continent nicht vorkommt."

This argument is presumably not invalidated by typical examples of this form from the coastal region of Tanganyika Territory in my collection, which may represent modern introductions.

I have not seen Wollaston's type, which has apparently been examined only by Blandford and Sampson, but I possess specimens determined by one or the other as *X. perforans*, which I refer to *X. sacchari* Hopk., and *X. mascarensis* Egg.; these are quite distinct from *X. kraatzi* by reason of the opaque declivity.

The Samoan series, and all the oriental specimens referable to the species now considered as *X. kraatzi* range from 2.1 to 2.4 mm. in length, are testaceous to dark ferruginous, never infusate, and consistently show a shining rugulose declivity. Eichhoff gives the measurement of his type as 2.0 mm.; hence this oriental form should probably be referred to his variety *philippinensis*.

The distribution of *X. kraatzi* according to Eggers (*loc. cit.*) is New South Wales, Solomon Is., New Britain, New Guinea, Aru Is., Buru, Philippine Is., Formosa, Banguet Is., Borneo, Bali, Java, Sumatra, Batu, Engano, Nias, Perak, Annam and S. Burma, to which may be added Hawaii and India, where the beetle is a borer of numerous species of timbers.

As regards the synonym *Xyleborus immaturus* Blackb., I am indebted to Mr. Arrow for the loan of a cotype.

30. *Xyleborus silvestris*, sp. n. (Text-figs. 10 and 11).

♀. Oblong, cylindrical, shining, pilose, declivity with 1st and 3rd interspaces tuberculate.

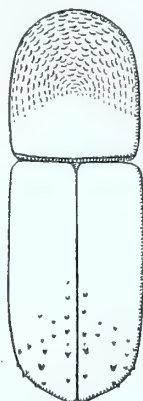
Colour ferruginous to piceous-brown, with thorax almost black.

Head: surface finely coriaceous, moderately shining, with strong piliferous punctures of irregular size, more closely punctate and impressed behind epistome; median line carinate-elevate and impunctate.

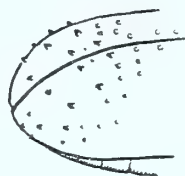
Pronotum about $1\frac{1}{4}$ times as long as broad (0.92 to 0.95 mm. \times 1.15 to 1.2 mm.); sides slightly rounded, widest at or behind middle, apex strongly rounded, base transverse, posterior angles obtusely rounded, transversely

elevated in middle, anterior half with sub-imbricate asperities, basal half shining, very finely and weakly punctate, with a somewhat alutaceous surface due to faint wrinkles arranged more or less concentrically around central elevation.

Elytra : more than $1\frac{1}{2}$ times as long as pronotum (0.9 to 0.95 mm. \times 1.5 to 1.6 mm.) ; sides subparallel at base, thence curved almost imperceptibly and widest near middle, narrowed and curved to apex ; declivity descending obliquely in apical third, somewhat deplanate ; striae straight, very closely and uniformly punctate, slightly impressed (sutural stria not more so than rest) ; interspaces



TEXT-FIG. 10.—*Xyleborus silvestris*,
sp. n. ♀, dorsal.



TEXT-FIG. 11.—*Xyleborus silvestris*,
sp. n. Declivity.

rugulose, closely but not always regularly punctate, punctures minute and piliferous ; on 4th and lateral interspaces punctures are about two-thirds as numerous as those of striae, and on dorsal interspaces about half as numerous (though occasional points are obsolete) ; 1st to 3rd interspaces with occasional small granules from summit of declivity towards middle of elytra, beyond which punctures are aciculate or normal ; 4th and 5th interspaces in neighbourhood of declivity with about five small granules ; declivity shining, suture not elevated ; 2nd interspace not impressed, strial punctures larger than on dorsum, flat, distinctly rimmed and subocellate ; 1st interspace with three or four tubercles, of which two or three are large and conical ; 2nd interspace exceptionally with one granule ; 3rd interspace with three to five tubercles, of which two may be large and conical ; terminations of 3rd and subsequent conjoined interspaces with a granule on declivital margin.

Pilosity : erect pronotal hairs in anterior zone longer than those on elytra ;

posterior zone usually denuded; elytral interspaces throughout with long, erect, yellow hairs, with a tendency to alternate long and short arrangement posteriorly, presence of a granule determining a longer hair; stria punctures each traversed by a microscopic recumbent hair, rather more evident on declivity.

Length: 2.6 to 2.8 mm.

♂ unknown.

Upolu: Malololelei, 2,000 ft., 20.iv.1925, vi.1924 (holotype), and 30.xi.1924.

Savaii: Safune, rain forest, 2,000 to 4,000 ft., 9.v.1924 (Bryan).

(Paratypes in Bishop Museum, Honolulu.)

Allied to *X. adumbratus* Bldfd. (Japan) in size and coloration, and to *X. kraatzi* Eichh. (Malay Peninsula) in elytral sculpture; separable from *X. adumbratus* by the more oval pronotum, and weaker, alutaceous punctuation of its posterior area, denser punctuation of elytral interspaces and less abrupt declivity; from *X. kraatzi* by its greater size, darker colour and pronotal punctuation.

31. *Xyleborus buxtoni*, sp. n. (Text-fig. 12).

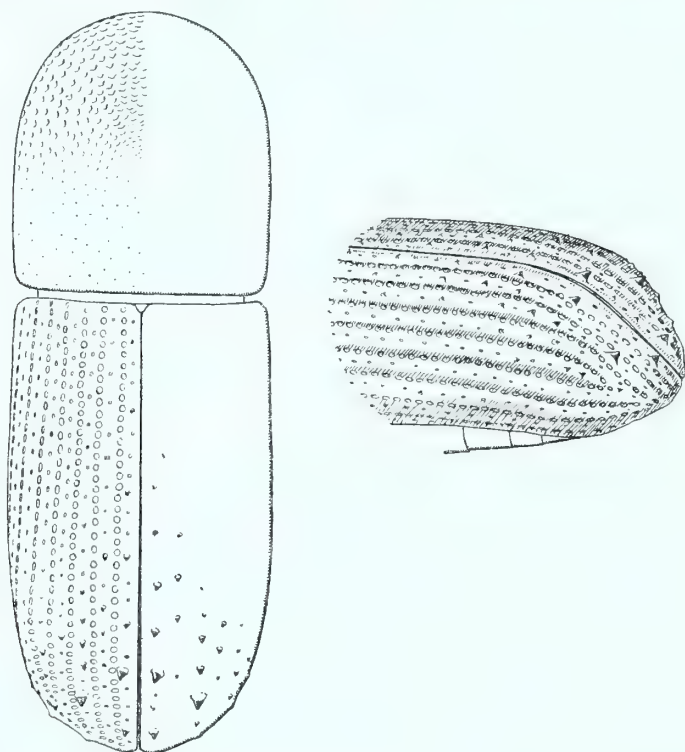
♀. Testaceous to dark ferruginous-brown, with elytra piceous.

Front convex, finely reticulate-coriaceous, dull, rugulose-punctate, punctures shallow and variable in size; median line elevated and shining in lower half.

Pronotum about 1.1 times as long as broad, cylindrico-convex, somewhat depressed in posterior half, basal angles obtusely rounded, sides subparallel, apex broadly rounded; anteriorly uniformly asperate, posteriorly and laterally smooth, very finely and sparsely punctate, punctures closer and stronger behind central umbonation; vestiture short and sparse.

Elytra as broad as and 1.6 to 1.75 times as long as pronotum, sides straight, perceptibly narrowed from behind middle towards apex, which is broadly rounded; cylindrical (with appropriate illumination, a feeble elevation behind base, followed by a feeble transverse depression, can be traced); declivity plano-convex, beginning in apical third, its apico-lateral margin carinate as far as intersection with 7th interspace; striae very strongly impressed on dorsum, less so at bases and laterally, punctures uniform, large, almost contiguous; interspaces narrow, smooth, shining, uniseriate-punctate or tuberculate; 1st uneven, less elevated than others, with about every 3rd puncture replaced by a tubercle directed caudad, tubercles increasing in size towards declivity; 2nd

subconvex, similarly tuberculate; 3rd subconvex, with tubercles obsolete in basal half; 4th, 5th, and 6th simply punctate, punctures smaller and more remote than those of striae, weakly tuberculate on approaching declivity; on face of declivity 1st interspace with two or three large conical tubercles, of which either middle or end one may be reduced or absent, 2nd smooth,



TEXT-FIG. 12.—*Xyleborus buxtoni*, sp. n. ♀, dorsal and declivity.

somewhat depressed, without tubercles, 3rd with one to three tubercles, of which the two end ones may be reduced or absent and middle one very large, 4th to 6th crowded to side with a few very small tubercles, apices of interspaces without strongly developed teeth or tubercles. Vestiture: strial punctures with minute hairs, interspatial punctures and tubercles with short erect hairs from base to apex.

Length: 3.1 to 3.3 mm.

♂ unknown.

Upolu: Malololelei, 2,000 ft., vi., vii., 23.xi.1924, 18, 25.iv.1925 (a series).

Savaii: Salailua, 22.v.1924 (Bryan), one specimen. (Paratypes in Bishop Museum, Honolulu.)

Distinguished from oriental allies in the *kraatzi-torquatus* group by size, and development of the dorsal tuberculation. The variation in size and relative position of the tubercles on the declivity is considerable in the short series ; when the middle tubercles of the 3rd interspace are symmetrically developed, and those of the 1st are less evident, the arrangement recalls species of the *confusus* group.

32. *Xyleborus affinis* Eichh. (auct.).

Berl. Ent. Zeitschr., xi, p. 401, 1867 ; *Rat. Tom.*, p. 372, 1879.

Upolu : Malololelei, 2,000 ft., vi. and 20.xii.1924.

Under the designation *Xyleborus affinis* previous authors, *i.e.* Blandford, Hagedorn, Schaufuss, and Sampson, have included a number of very closely allied forms with an opaque declivity, found in the Neotropical, Ethiopian, Oriental, and Australian regions. Eichhoff himself recognised three varieties, α , β , and γ , but did not define them very satisfactorily.

Eggers has recently treated var. β as a distinct species under the name *X. mascarensis* (*Treubia*, vii, p. 301, 1926, and ix, p. 408, 1927), but without giving any reasons for so doing. The five specimens taken by Messrs. Buxton and Hopkins may possibly be referable to *X. mascarensis*, which is stated to be distributed throughout Central Africa and the Malay Region ; but, compared with "*affinis*" material before me, they agree remarkably well with specimens from Costa Rica and French Guiana of the same length (2.25 to 2.3 mm.) and coloration (light ferruginous-testaceous), and are less strongly punctate than specimens from East Africa and Ceylon.

33. *Xyleborus confusus* Eichh.

Berl. Ent. Zeitschr., xi, p. 401, 1867.

Tutuila : Pago Pago, 0 to 300 ft. (Kellers, Swezey and Wilder) ; Leone Road (Judd, Swezey and Wilder).

Upolu : Apia ; Vailima, 600 ft. ; Mt. Vaea, 1,500 ft. ; Malololelei, 2,600 ft.
Samoa : (Swale ; Friedrichs).

Taken in every month of the year.

Known to occur in Hawaii Is., Fanning Is., Washington Is., Fiji, Queensland, New Guinea, Keeling Is., Seychelles Is., Madagascar, Zanzibar, E. Africa, Uganda, Eritrea, Congo, Ivory Coast, Fernando Po, St Thomas Is., Annobon,

Cape Verde Is., South and Central America, Trinidad, Barbados, Guadeloupe, Cuba, Florida, Mississippi. In spite of Hagedorn's generalisation that this species "ist im ganzen Tropengürtel weit verbreitet" (*Rev. Zool. Africaine*, i. p. 344, 1912), there are no authentic records of it from any part of the Indo-Malayan region. It is definitely one of the very few species that Samoa has not received from the west.

The only identified food plants that have come to my notice are *Hevea braziliensis*, *Cocos nucifera* (wood and nuts) and *Manihot utilissima* (wood) in the tropics. Blackman found this beetle in dead *Pinus palustris* in Mississippi.

34. *Xyleborus hopkinsi*, sp. n.

♀. Cylindrical, shining, light to dark ferruginous-brown.

Front convex, irregularly rugose-punctate on a finely reticulate ground, median line elevated, shining.

Pronotum very little longer than broad (1.15×1.05 mm.), sides subparallel, apical margin strongly rounded, basal angles obtusely subrectilinear, asperation of anterior area distinctly smaller and flatter towards sides and central elevation, posterior area brilliant, very finely, sparsely punctate.

Elytra rather narrower at base than prothorax, and about 1.7 times as long as pronotum, cylindrical, somewhat depressed above, sides subparallel from base to well beyond middle, and thence curved and narrowed to apex; striae straight, weakly impressed, closely punctate; interspaces nearly flat with a series of piliferous punctures, which are rather strong, sometimes as large and deep as those of striae, spaced irregularly, but usually more than half as numerous as striae punctures. Declivity commencing in apical third; suture and 1st interspace flat, depressed; 2nd interspace depressed towards its inner edge; 3rd convex; remainder gradually rounded to elytral margin; 1st interspace at summit of declivity with a small, conical tubercle and two to three smaller granules cephalad of it, on face of declivity with a series of minute punctures bearing short hairs; 1st stria slightly impressed punctate throughout; 2nd interspace with three or four small granules before summit, shining and finely punctate on face of declivity; 3rd interspace with one to three small tubercles at summit, one very large conical tooth a little below centre, and one smaller tubercle towards apex, a few long hairs between tubercles; remaining interspaces with a few small tubercles round margin of declivity.

♂ unknown.

Length : 2.9 to 3.2 mm.

Upolu : Malololelei, 2,000 ft., 24.ii., iv., vi.1924 ; 18.iv.1925 (Buxton and Hopkins) ; vii.1925 (Wilder).

Savaii : Salailua, 21, 22.v.1924 (Bryan).

(Paratypes in Bishop Museum, Honolulu.)

Closely allied to *X. fuscatus* Eichh. (America), which has the striae less evidently impressed, the inner interspaces flatter, and the interspatial punctures stronger. The declivity of *X. hopkinsi* is more oblique and oval, and the tubercle of the 3rd interspace is placed lower than in *X. fuscatus* ; the elytra are narrowed more gradually, and are less broadly rounded at the apices than in *X. fuscatus*.

35. *Xyleborus submarginatus* Bldfd.

Tr. Ent. Soc. Lond., p. 223, 1896.

Upolu : Apia, iii.1924, i.1925 (2 specimens).

Recorded in literature from Ceylon, India, Burma, Sumatra to New Guinea and Australia, but how far correctly is open to doubt.

The Samoan specimens are 2.25 mm. in length, with a subquadrate pronotum, and declivital armature as in *X. bucco* Schauf. (Seychelles Is.).

36. *Xyleborus baculum*, sp. n. (Text-fig. 13).

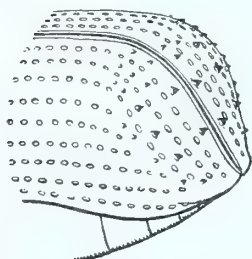
♀. Cylindrical, testaceous-ferruginous.

Front convex, minutely reticulate-alutaceous, with sparse rugulose punctures bearing long hairs ; median line smooth in centre, not raised.

Pronotum 1.2 times as long as broad, base truncate, basal angles subrectilinear, sides parallel nearly to anterior third, apex uniformly rounded, cylindrical, declivous in less than anterior half ; asperities small, subtriangular, weakly developed along apical margin and in antero-lateral areas, and scarcely extending to middle of pronotum dorsally ; posterior region smooth, moderately shining, with sparse short hairs, of which punctures are not discernible. Scutellum semicircular.

Elytra cylindrical, as wide as and 1.6 times as long as pronotum, 1.9 times as long as wide, basal angles subrectilinear, parallel almost to end, declivity flattened and subvertically truncate, its sides and summit obtusely rounded,

its apex very slightly produced and margined at terminations of 1st and 2nd interspaces; striate-punctate, striae punctures close, shallow, much less distinct



TEXT-FIG. 13.—*Xyleborus baculum*, sp. n. ♀, declivity.

in basal fifth; interspaces shining, flat, with a few remote, scarcely perceptible, punctures, and all with large granules at edge of declivity; on face of declivity, which is shining, 1st interspace is widened and has two or three small tubercles; 2nd with five to seven minutely granulate punctures; 3rd with three large granules, alternating with granulate punctures; 4th and 5th interspaces with smaller granules; suture not raised and striae not impressed, striae punctures larger and more irregular than dorsally; vestiture of long

hairs from granules, and shorter hairs from interspatial punctures.

Length: 2.2 mm.

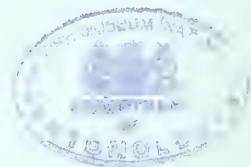
♂ unknown.

Upolu: Malololelei, 2,000 ft., vi.1924 (2 specimens).

In the steepness of the declivity comparable with *X. monographus* F. (Europe) or *X. recidens* Samp. (Bengal to New Guinea), but characterised by the rounding off of the circumference of the declivity everywhere, except for a short distance at the extreme sutural apex, where the marginal channel of the elytron is interrupted, and the edge of the declivity coincides with the edge of the elytron.

LIST OF TEXT-FIGURES.

- Text-fig. 1. *Platypus tetracerus*, sp. n. ♂.
 „ 2. *Hylesinus pacificus*, sp. n. Dorsal and lateral.
 „ 3. *Scolytomimus maculatus*, sp. n. Dorsal.
 „ 4. „ „ sp. n. Abdominal sternites.
 „ 5. *Cryphalus samoensis*, sp. n. ♂ and elytral details.
 „ 6. *Cryphalus (Hypocryphalus) basihirtus*, sp. n. Dorsal.
 „ 7. *Xyleborus swezeyi*, sp. n. ♀, dorsal and declivity.
 „ 8. *Xyleborus samoensis*, sp. n. ♀, dorsal and declivity.
 „ 9. *Xyleborus artelineatus*, sp. n. ♀, declivity.
 „ 10. *Xyleborus silvestris*, sp. n. ♀, dorsal.
 „ 11. „ „ sp. n. Declivity.
 „ 12. *Xyleborus buxtoni*, sp. n. ♀, dorsal and declivity.
 „ 13. *Xyleborus baculum*, sp. n. ♀, declivity.



INSECTS OF SAMOA

AND OTHER SAMOAN TERRESTRIAL ARTHROPODA

LIST OF PARTS AND SYSTEM OF PUBLICATION:—

- Part I. Orthoptera and Dermaptera.
 „ II. Hemiptera.
 „ III. Lepidoptera.
 „ IV. Coleoptera.
 „ V. Hymenoptera.
 „ VI. Diptera.
 „ VII. Other Orders of Insects.
 „ VIII. Terrestrial Arthropoda other than Insects.

The work is published at intervals in the form of numbered fascicles. Although individual fascicles may contain contributions by more than one author, each fascicle is so arranged as to form an integral portion of one or other of the Parts specified above.

List of Fascicles issued to 22nd June, 1929:—

- | Insects of Samoa and other Samoan Terrestrial Arthropoda. Maps 1 and 2 (in envelope). 1927, 4to. 6d. | <i>Date Issued.</i>
26th February, 1927. |
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| Fasc. 1. Isopoda Terrestria. By Harold G. Jackson, D.Sc. 2 plates. Scorpionoidea. By P. A. Buxton, M.A. Pseudo-scorpiones. By A. Kästner. 11 text-figures. Acarina. By Stanley Hirst. 2 text-figures. Pp. 1-27. 1927, 4to. 2s. 6d. | 23rd July, 1927. |
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