

fin; interorbital space flat and broad; a few obscure bony ridges on the hinder part of the cranium. Jaws of equal length; maxillary reaching to behind the posterior nostril, its hinder margin obliquely truncate and exposed. Eye rather small, a little shorter than the snout and much narrower than the interorbital space. Nostrils separated by a space slightly wider than their own diameter, with free cutaneous margins. Preorbital bone denticulate posteriorly. Preoperculum denticulate, the denticles largest on the rounded angle. Operculum with two spines, the lower the larger and not reaching the margin of the lobe. Suprascapular and coracoid bones exposed and feebly serrated.

Each jaw with a band of minute teeth, the outer ones a little enlarged, subcardiform, and slightly depressible. Vomer with three or four small teeth in the middle, the palate otherwise toothless. Scales largest on the anterior portion of the sides, smallest on the breast.

Spinous dorsal arched, the fifth spine the longest, the following decreasing evenly backward; soft dorsal somewhat rounded. Second anal spine a little longer than the third, and almost as long as the anterior rays. Pectoral obtusely pointed above, the fifth upper ray longest. Ventrals inserted behind the vertical of the first dorsal spine, and reaching a little more than half their distance from the vent. Caudal emarginate.

Described from a specimen 140 mm. long, which is completely bleached after long preservation in alcohol. It is allied to *T. hillii*, from which it differs principally in its broad form and in having only eight anal rays; its scales also are rather smaller than in that species.

Loc.—Cooper Creek or "Barcoo," Central Australia.
Old collection, S.A. Museum.

(l) CRUSTACEA.

By CHARLES CHILTON, M.A., D.Sc., M.B., C.M., LL.D.,
F.L.S., C.M.Z.S., Professor of Biology,
Canterbury College, New Zealand.

In his expedition to the interior of Australia in 1916 Mr. Edgar R. Waite collected a few Crustacea, which he has kindly handed over to me for examination. The collection is small, both in species and individuals, containing only two terrestrial Isopoda, two species of Phyllopoda, and one Copepod.

In addition to these, however, Mr. Waite also forwarded a few additional Crustacea collected by Capt. S. A. White in an expedition to the north-west corner of South Australia in 1914.⁽¹⁾ This collection does not contain any of those represented in Mr. Waite's, but there are in it two other Phyllopods that I have been able to identify. There are also some specimens, mostly dried, of two Ostracods and one Daphnid, but these I have not attempted to name.

All the Phyllopods belong to species already known, but the distribution of one or two is now somewhat extended by the record of their occurrence in Central Australia; they are, however, all species widely distributed in Australia.

Among the specimens of *Estheria packardii* from Cooper Creek I found two examples of a Copepod belonging to the genus *Boeckella*. Both were males showing the last pair of legs prehensile and terminating in a long, movable claw in the manner characteristic for the genus. The antennae are very similar to those of *Boeckella triarticulata*, the typical species from New Zealand, which has also been recorded from Australia by Sars. Other species of the genus have been described by Sars and by G. W. Smith⁽²⁾ from Australia and Tasmania, and I do not feel justified in identifying my two specimens specifically, but the occurrence of the genus in Central Australia is worthy of record.

These freshwater Crustacea can, of course, be obtained only when the waterholes contain water; after rain they hatch out, often with great rapidity, from eggs previously deposited in the dried mud. If future collectors would bring back portions of the dried mud from the waterholes, it would be possible to hatch out the Crustacea and study them in the laboratory, as Sars has done those from New Zealand, Australia, and other parts of the world. This would be easier and more likely to lead to the discovery of new forms than trying to collect the animals on the rare occasions when the explorer finds the pools are full after rain.

I have been unable to identify the two terrestrial Isopoda with any of those previously described, and have therefore described them as new species. This, however, is somewhat uncertain, because the species of terrestrial Isopoda are extremely difficult to distinguish, and it is quite possible that one of them, at any rate, may be identical with one of the many species described by Budde-Lund; without having actual specimens for comparison it is, however, very difficult to decide. If I am right in referring the first Isopod

(1) Trans. Roy. Soc. S. Austr., xxxix., 1915, p. 707.

(2) G. W. Smith: The Freshwater Crustacea of Tasmania, Trans. Linn. Soc., (2), xi., 1909, p. 85.

to the genus or subgenus *Hemiporcellio*, it would appear to show some relationship to the species described from India by Dr. Collinge. The terrestrial Isopoda of Australia, however, are only very imperfectly known, and it is therefore not safe to make any definite statements as to their distribution.

The following is a list of the species in the two collections, with descriptions and notes where required:—

ISOPODA.

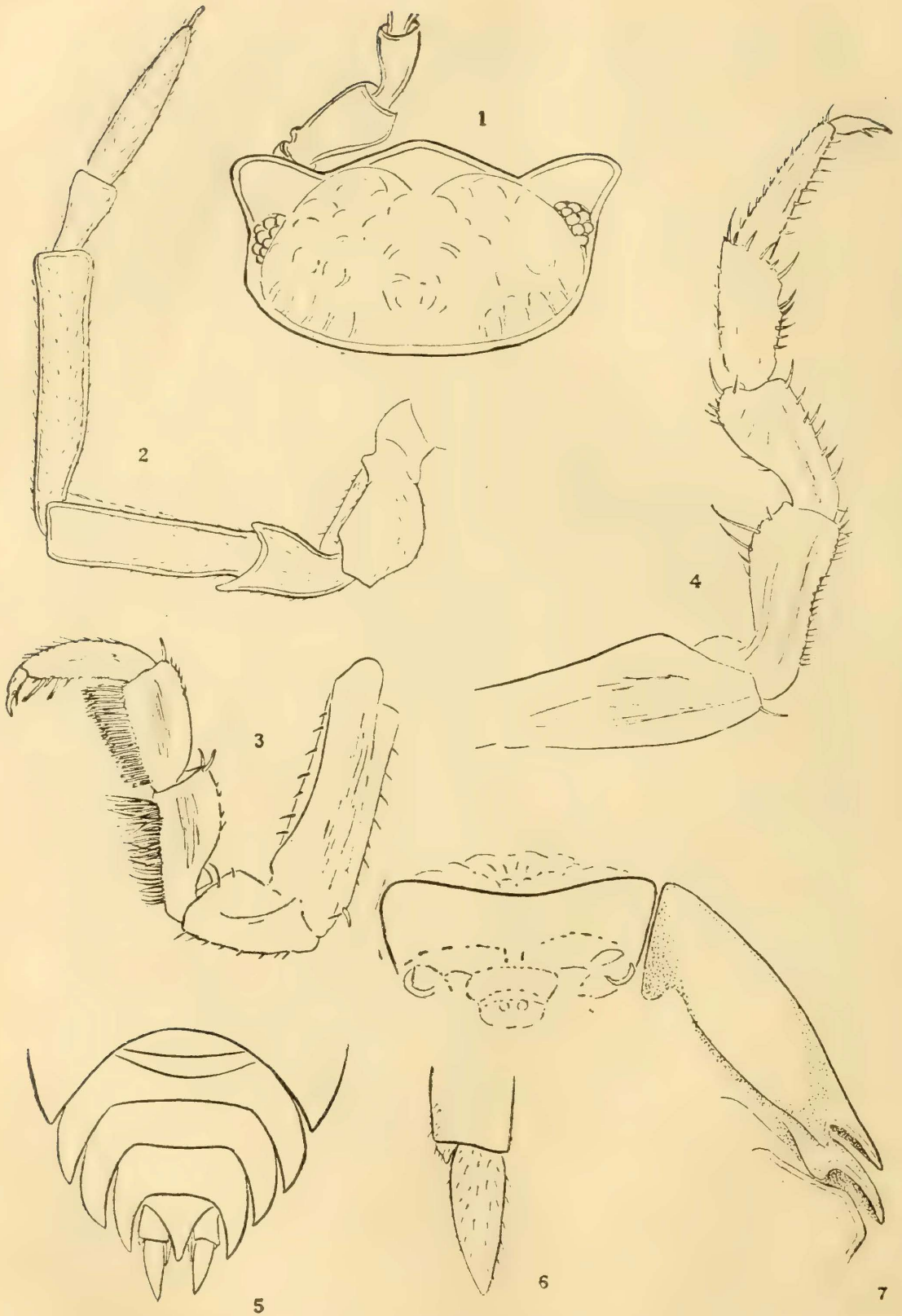
HEMIPORCELLIO STRZELECKI, n. sp.

Figs. 1-6.

Loc.—Strzelecki Creek, 2 specimens.

Of these two specimens one is a male with body 6 mm. long and 2.25 broad; the other is female with body 5 mm. long and 2.5 mm. broad, being thus rather broader in proportion than the male. It is, however, very imperfect, perhaps crushed, and has lost the antennae, most of the legs, and the uropods, but portions of the brood plates and eggs are still present. I should have hesitated very much to describe a new species on such insufficient specimens, but the male is quite perfect and, on the whole, agrees so closely with the species from India for which Collinge established the genus, *Hemiporcellio*, that I have ventured to give the specimens a name; the description, however, must be considered to be provisional only.

Specific diagnosis.—Body oblong-oval, head and two or three anterior segments of peraeon with some irregular rounded tuberculations, the posterior segments and pleon almost smooth, the whole surface of body and antennae and uropods covered with fine setae. Head with lateral lobes broad, median lobe rounded anteriorly, depressed below the more posterior part of the head, which is covered with rounded tubercles. Antennae with distinct carination on the fifth joint of the peduncle, flagellum 2-jointed, proximal joint about half as long as the distal. First pair of legs short, having the inner margin of the carpus thickly covered with short setae, most of which end in two or three points; merus also bearing similar setae though not so numerous; propod with two or three stout ordinary setae towards the distal end. The second and third pairs of legs show similar setae, but they are less numerous than in the first. Segments of peraeon only slightly convex, posterior margin of the first sinuate, so that the posterior angle of the side-plate is slightly produced; side-plates of the remaining segments becoming more acute posteriorly. Pleon not narrower than peraeon,



Hemiporcellio strzelecki.—1, Head, from above; 2, antenna; 3, first leg of male; 4, seventh leg of same; 5, pleon (less highly magnified than the other figures); 6, uropod.

Cubaris claytonensis.—7, Under-surface of head and of first and second segments of pereopod.

side-plates of segments 3, 4, and 5 large, their outer margin being continuous with that of the peraeon; terminal segment narrow, triangular with sides slightly concave and reaching well beyond the peduncle of uropods, and about as far as the extremity of the inner branch. Uropod with basal joint broad, grooved externally; exopod narrow, conical, about as long as the terminal segment; endopod reaching half-way along the exopod and ending in two or three small setae.

Colour.—Light brown with marblings and median stripe of dark brown.

Remarks.—In the general shape of the body, in the carination of the antennae, the setae on the anterior legs of the male, and in the triangular terminal segment this species agrees well with the Indian species of the genus: on the whole, it seems perhaps to come nearest to *H. hispidus*, Collinge, with which it agrees in the proportions of the joints of the flagellum of the antennae and in the general covering of the body, but it differs from that species in having the median lobe of the head distinctly produced and convex, and also in having the terminal segment longer and narrower.

CUBARIS CLAYTONENSIS, n. sp.

Fig. 7.

Locs.—Clayton Creek, 2 specimens; Higgins Dam, 1 specimen.

Specific diagnosis.—Oval, strongly convex, whole surface minutely granular, head and lateral portions of anterior segments of peraeon with a few larger granular markings. Head much broader than long, frontal ridge not produced above the dorsal surface of the head and slightly emarginate in the centre. Epimeral plates of first segment very large, reaching to the anterior margin of the head: lower margin turned outward anteriorly so as to become almost horizontal; posteriorly it is split, inner tooth much smaller and shorter than the outer; epimeron of second segment with tooth on the inner surface near its anterior margin. Posterior margin of first segment straight in centre, but with the epimeral portion curving backwards. Epimera of segments 2 to 7 well developed, almost vertical, only sloping slightly outwards. Pleon with the epimeral portions of segments 3, 4, and 5 largely developed and fitting into the general outline of the body. Terminal segment broader than long, narrowed in the middle, its posterior margin straight and narrower than the anterior margin.

Antennae normal, slender, the two joints of the flagellum equal. Uropods with the basal joint longer than broad, exopod very small, inserted in a slight notch about the middle

of the inner margin and not reaching to the posterior margin; endopod very small and short, almost knob-like, reaching only a very slight distance beyond the base.

Colour.—Dark slatish with light-brown markings along the lateral and hind margins of the segments.

Length.—About 15 mm.

Remarks.—I describe this species with considerable hesitation. In general size, surface of body, etc., it resembles *C. montivagus* (Budde-Lund), which is found in the Samoan Islands, but it differs markedly from that species in colour, in having the epimeron of the first segment curving outwards anteriorly, and in having the inner lobe of the split margin the smaller instead of being the larger, as in *C. montivagus*.

PHYLLOPODA.

APUS AUSTRALIENSIS, Spencer and Hall.

Apus australiensis, Spencer and Hall: "Victorian Naturalist," xi., 1895, p. 161; Sayce: Proc. Roy. Soc., Vict., xv., 1903, p. 241 (with synonymy).

Locs.—Clayton Creek, 5 specimens; Cooper Creek, 1 specimen.

I have little doubt that these specimens belong to the species named above, which is the only species of the genus yet known from Australia. According to Spencer and Hall, specimens from many widely-separated parts all belong to this species. Sayce gives as the distribution: "Western Australia, South Australia, northern areas of New South Wales, and northern areas of Victoria."

In the general dimensions and proportions the specimens agree well with the description given by Spencer and Hall in their report on the Crustacea of the Horn Expedition, though according to them there are variations in the dimensions of considerable extent. Similarly the number of spines on the different segments show slight differences from their description, but the only difference of any importance I have noticed is that in the specimens I have examined the carina on the carapace is smooth and does not end posteriorly in a spine; Spencer and Hall describe the carina as being "minutely and irregularly serrated and ending in a spine posteriorly."

The colour of the specimens examined is olive-green tending to brown at the edges, along the carina, etc.

ESTHERIA PACKARDI, Brady.

Estheria packardi, Sayce: Proc. Roy. Soc. Vict., xv., 1903, p. 250.

Loc.—Cooper Creek, several specimens.

These specimens average about 9 mm. in length, and show little variation in size. They agree well with the description given by Spencer and Hall and Sayce of this species, which was collected by them in Central Australia, and is known also from various other localities in Victoria, New South Wales, South Australia, etc.

Spencer and Hall divided the species into three varieties, stating that although the extreme forms of these were clearly distinct, there were intermediate forms which rendered it impossible to place them in separate species. The specimens I have examined come nearest to their variety *typica*, having about 24 lines of growth, which bear a few setae, the interspaces being marked by raised lines arranged mostly in a radiate manner. The colour is a dark chestnut-brown, somewhat lighter near the margins of the shell.

LYNCEUS MACLEAYANA, King.

Lynceus macleayana, Sayce: Proc. Roy. Soc. Vict., xv., 1903, p. 258, pl. xxxvi., fig. d.

Locs.—Between Todmorden and Wantapella Swamp, 1 specimen (in spirit), 6 mm. long; rock hole, west of Carmeena, Everard Range, 10/8/14, 2 specimens, dry, one 5 mm. long, the other smaller.

These specimens are much larger than those referred below to *L. eremia*, and in size, shape of shell, etc., appear to belong to King's species, which has been recorded from various places in Victoria and New South Wales, but the material is so scanty and imperfectly preserved that I am not certain of the identification.

LYNCEUS EREMIA, Spencer and Hall.

Limnetis eremia, Spencer and Hall: Crustacea, Horn Exped., ii., 1896, p. 244, figs. 30-32.

Lynceus eremia, Sayce: Proc. Roy. Soc. Vict., xv., 1903, p. 258, pl. xxxvi., fig. f.

Locs.—Carmeena, rock hole, Everard Range, 14/8/14, many specimens; flat rock hole, 30 miles east of Musgrave Ranges, 16/7/14, several specimens.

These specimens vary somewhat in size, but average about 4 mm. in length, and in size, colour of shell, structure of the rostrum, etc., agree with the description given by Spencer and Hall from specimens collected by them at Cooper Creek, Central Australia. This is the only locality given by Sayce in 1903, so that the record of them from the localities near the Everard and Musgrave Ranges is an extension of their distribution.

COPEPODA.

BOECKELLA, sp.

Two specimens from Cooper Creek found in the tube with *Estheria packardi* undoubtedly belong to this genus, but the material is not sufficient to determine the species with certainty. The specimens have been already referred to in the introductory remarks to this paper.

OSTRACODA.

In the collection are dried specimens of two species of *Cypris*, or allied genus, from "rock hole, west of Carmeena, Everard Range," collected by Capt. S. A. White, 10/8/14; the one is oval in shape, about 2 mm. long, and light brown in colour, the other is much smaller and greenish in colour. Other specimens apparently belonging to the first species are "from flat rock hole, 30 miles east of Musgrave Ranges, Capt. S. A. White, 24/7/14." In both cases specimens of *Lynceus eremia* were present in the same tube.

CLADOCERA.

DAPHNIA, sp.

Dried specimens of a *Daphnia* with carapace produced into a long spine similar to that of *Daphnia thomsoni*, Sars, were found with the Ostracods mentioned above from the "rock hole, west of Carmeena, Everard Range." They are about the same size as *D. thomsoni*, which is known to occur in Australia, but in their dried and shrivelled condition a definite identification is impossible.

 (m) ARANEIDÆ.

By W. J. RAINBOW, Entomologist to the
Australian Museum, Sydney.

PLATE XXXII.

Only seventeen species and one variety were collected, and of these five are described as new. There is nothing really remarkable in the specimens collected: indeed, they bear a close analogy to littoral forms. A few desert species