

of the State of New York, p. 52, also in the Aquarium, Jan. 1894, p. 91, and again in the Fishing Gazette of May 31, 1894, with references in each case to the original. I am pleased to see that Mr. F. H. Herrick, in the Zoologischer Anzeiger, No. 454, Aug. 13, 1894, p. 29, confirms my observations on times, rates, and on variations along our coasts, etc., even though he does not make it entirely clear why he should prefer to give the impression that my work was first published in the Aquarium of January 1894.

3. Microcrustacea from New Mexico.

By C. L. Herrick, Professor in Denison Univ.

eingeg. 30. November 1894.

The valley of the Rio Grande passes through a region which is by nature almost a desert, although capable of great fertility under irrigation. Although the year is almost rainless there are a few weeks during which copious showers fill such natural reservoirs as exist. In these pools there soon appear large numbers of Phyllopod Crustacea, *Apus*, *Branchipus*, *Nebalia*, etc. — a fauna sufficiently known through the labors of Professor Packard and others. Among these types which are characteristic of the western plains are a few species of the strictly Microcrustacea which deserve special study. These are chiefly members of the orders Copepoda, Cladocera and a few Ostracodes. Although one would expect a priori a rather limited representation of such types, there is no lack of individuals. The numbers of *Moina* which appear in fresh rain pools is enormous, and curiously enough, we find *M. rectirostris*, *M. brachiata* and a third form either associated in the same pool or in adjacent waters. *Moina* and several species of *Ceriodaphnia* may rank with the *Phyllopods* as »occasionalist« or desert crustacea. We were also surprised to find in the less transient pools numerous examples of the American *Latonopsis occidentalis* Birge, which is closely allied with the Australian *L. australis* Sars. *Simocephalus* and *Scapholeberis* with *Chydorus* and a small *Pleuroxis* are not uncommon, but a single example of a new species of *Daphnia* almost completes the list of Cladocera so far encountered.

The Cyclopidae are represented by *C. tenuicornis* Claus, *C. bicolor*, *C. serrulatus* and *C. viridis americanus* Marsh. No unique species occur, while the *Calanidae* and *Harpacticidae* are all new. With these introductory words I beg to pass to the description of a few forms which seem worthy of present notice though all will be illustrated in full in the forthcoming report to the state Zoologist of Minnesota upon the Microcrustacea of Minnesota.

Genus *Marshia*¹, gen. nov.

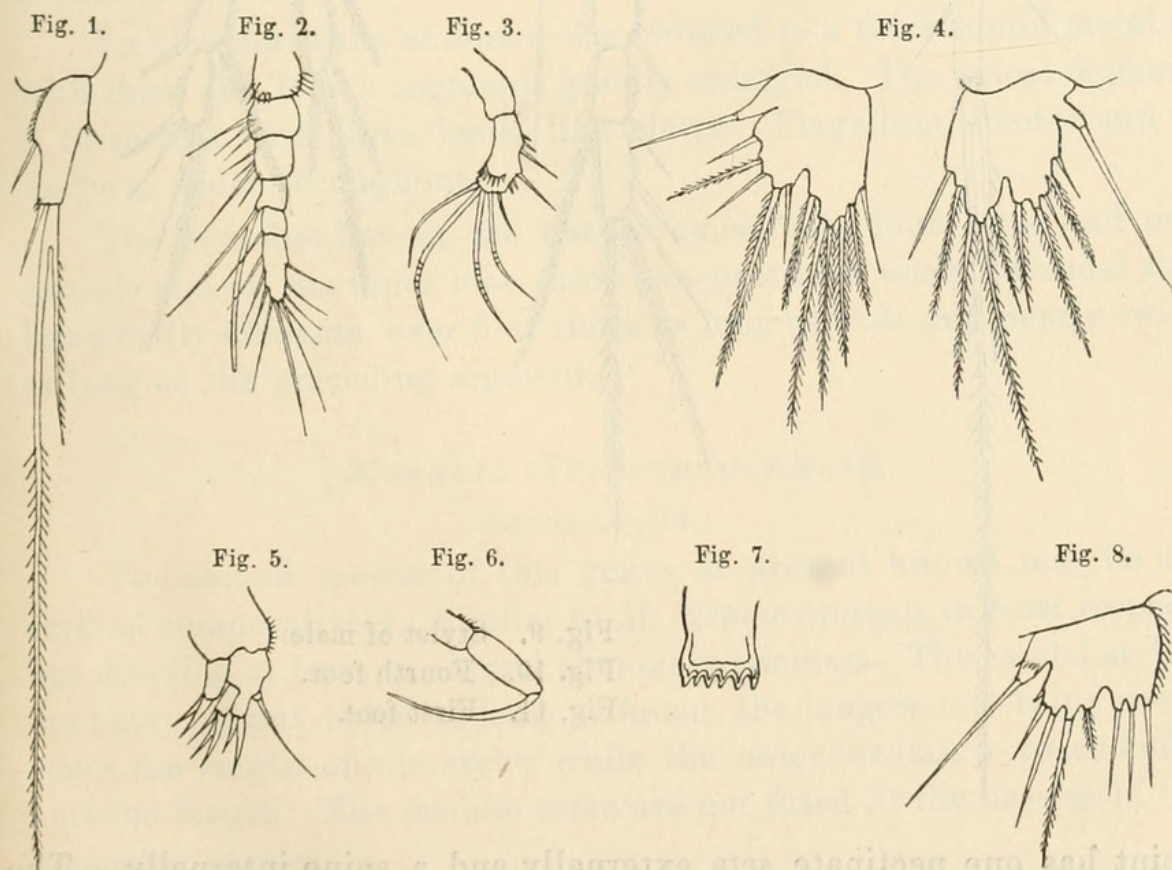
Allied with *Attheyella*. Inner branch of first foot 3-jointed, scarcely elongated, barely sub-prehensile.

Second and third feet with outer rami 2-jointed, short. Fourth foot with outer ramus 1-jointed. Fifth feet 1-jointed. Antennae 6-jointed, the fourth joint with a slender hyaline process longer than the end of the antennae. Antennule without obvious palpus, prehensile. Mandiblar palp simple (?). First foot-jaw with a uniciliate tubercle-like palp. Second foot-jaw with a long claw-like apical joint. Antennae of the male strongly modified. Fresh or brackish waters of the Rio Grande valley.

Marshia albuquerqueensis n. sp.

(Figures 1—11.)

Body with ten obvious segments, having the aspect of *Canthocamptus*. Antennae short, 6-jointed. The proximal joint enlarged



- Fig. 1. Caudal stylet of *Marshia albuquerqueensis*, ♀.
 Fig. 2. Antenna of female.
 Fig. 3. Antennule.
 Fig. 4. Feet of right and left sides of a female, the right foot anomalous.
 Fig. 5. Anterior foot-jaw.
 Fig. 6. Posterior foot-jaw.
 Fig. 7. Mandible.
 Fig. 8. Fifth foot of male.

¹ In compliment to Professor C. Dwight Marsh of Ripon, Wisconsin.

and spinous; second joint also tumid, with three or more cilia; third joint longer; fourth with a long seta and a still longer flagellum; fifth joint very short; apical joint elongate, bearing about ten setae. Antennules short, prehensile, with four geniculate setae apically and several short spines, especially a transverse row of sharp teeth on the dorsal aspect. Mandibles with six sharp teeth. Anterior maxillipeds with a minute unisetose palpus and three processes bearing claw-like spines. Posterior maxilliped with an apical claw longer than the preceding segment. First foot with the outer ramus nearly as long as the inner, 2-jointed, bearing at the apex three pectinate setae. The basal

Fig. 9.

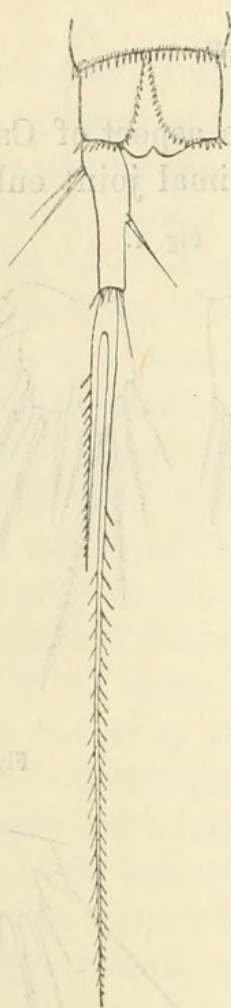


Fig. 10.

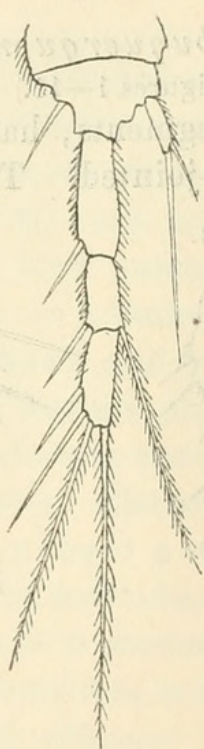


Fig. 11.

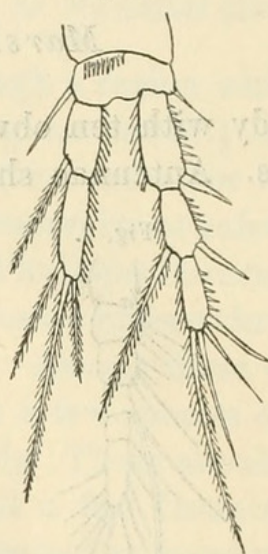


Fig. 9. Stylet of male.

Fig. 10. Fourth foot.

Fig. 11. First foot.

joint has one pectinate seta externally and a spine internally. The inner aspects of all the joints of both rami are spinous, the outer setose. The outer ramus of the second foot is two-jointed and has one pectinate seta apically, one spine internally and a spine externally, while the corresponding segment of the third foot has two pectinate setae apically, one internal seta and two external spines.

The fourth foot has a minute one-jointed outer ramus which bears one long pectinate seta and a short external spine. The fifth foot seems

to consist of one piece which is armed as follows: Externally a conical projection near the base with a long simple seta; outer apical lobe (= the homologue of the second joint) with five setae, the second and fourth of which are pectinate and longer than the rest; the inner apical lobe bears six (sometimes only five) setae, all but the innermost being pectinate. The two lobes are separated by a simple rounded incision and repeated examination of a number of individuals failed to discover any signs of division or segmentation. The abdomen is very slender, and, like the thorax, its segments are all ornamented along the caudal margin with a row of teeth. Caudal stylet two and a half times as long as wide, with one or two small spines externally at a point one-third the length from the base and one longer spine near the middle of the inner margin which is ciliate. The two median apical setae are fused at the base and the inner is three times as long as the outer, which is twice as long as the stylet. The inner apical seta is short, the outer obsolescent.

In the male the antennae are reduced to a thick tumid member with third and fourth segments greatly enlarged. The apical segment is furnished with three hook-like claws. Flagellum slender and of uniform width throughout.

The fifth foot has on the outer apical lobe four setae and one spinule and on the inner lobe three non-pectinate setae. Caudal stylets greatly elongate, over four times as long as wide and nearly twice as long as the preceding segment.

• *Marshia brevicaudata* n. sp.

(Figures 12—15.)

The second species of this genus at present known may be described comparatively. Similar to *M. albuquerqueensis* in most respects but differing at least in several obvious particulars. The caudal stylets are short, about twice as long as broad, the longest seta being seven times the length of the stylet while the outer median is twice and a half the length. The median setae are not fused at the base as in the preceding species.

In the male the proportions of the stylet are nearly the same as in the female but the longest seta is nine times as long as the stylet. The fifth foot of the female is nearly the same as in the preceding species, but the proportions of the setae differ. The fifth feet of the male closely resemble those of *M. albuquerqueensis*. The antennae of the male differ. The flagellum is shorter and clavate. The swimming feet seem to be similar in the two species. Length of male, .56 mm;

length of first segment, .15 mm.; length of stylet, .04 mm.; length of longest seta, .28—.34 mm.

The stylets of the female of *M. albuquerqueensis* measure .072 mm, and those of the male over .08 mm, the longest seta being .37 mm

Fig. 12.

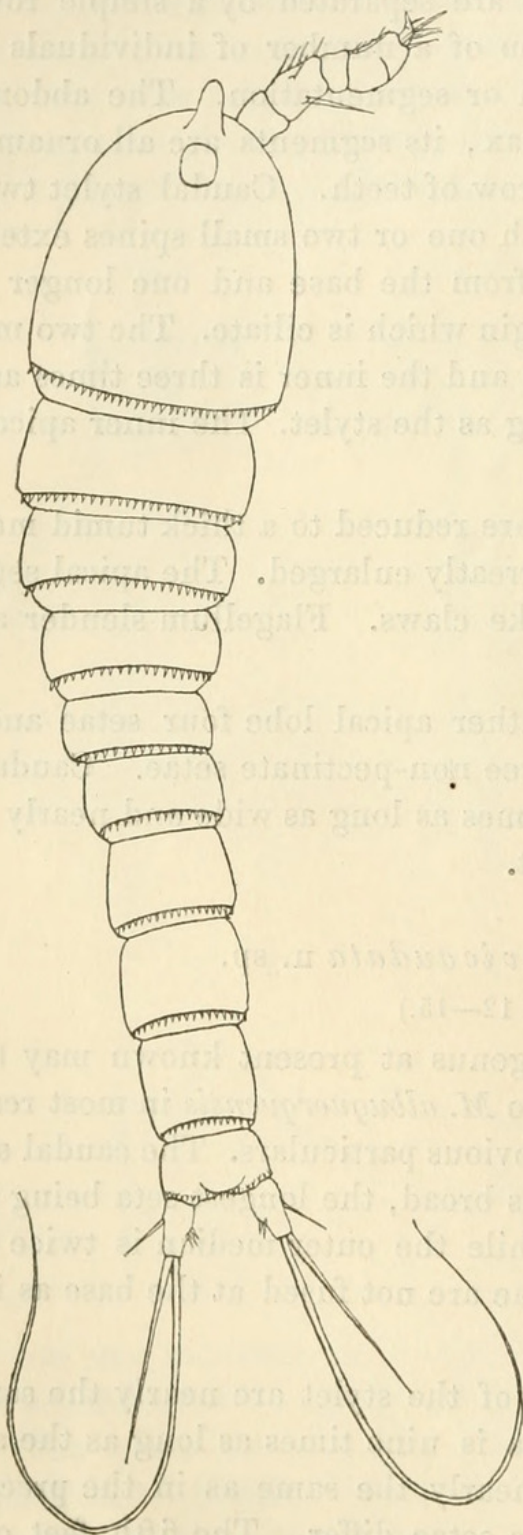


Fig. 13.

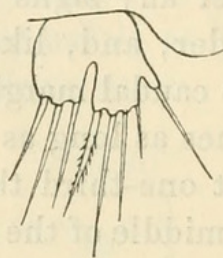


Fig. 14.

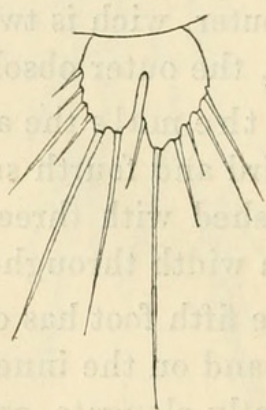


Fig. 15.

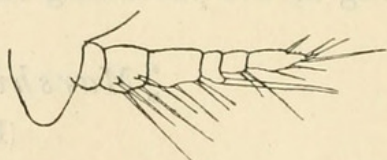


Fig. 12. Habitus outline (camera lucida) of *Marshia brevicaudata*, ♂.

Fig. 13. Fifth foot of male.

Fig. 14. Fifth foot of female.

Fig. 15. Antenna of female.

and .42 mm respectively. It must remain for larger experience to determine the value of these distinctions which rest upon comparatively few individuals in the case of *M. brevicaudata*.

Diaptomus albuquerqueensis n. sp.

(Figures 16—26.)

Species of moderate size. The cephalothorax is widest near the middle. The last two segments are fused and the last projects laterally where it is armed with two strong spines; there is also a dorsal protuberance from the last segment. The first abdominal segment is

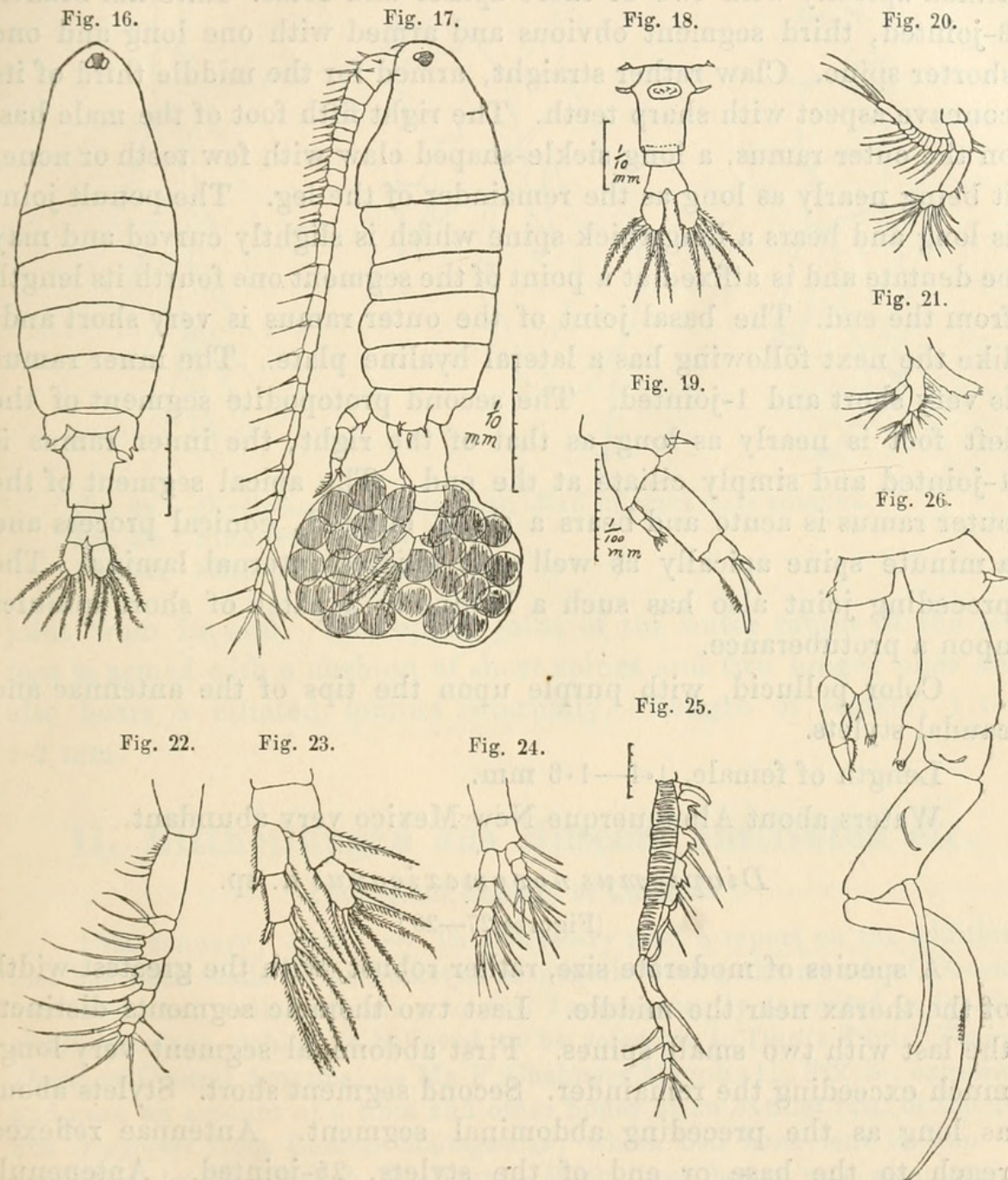


Fig. 16. *Diaptomus albuquerqueensis*, *
dorsal view.

Fig. 17. Lateral view of female.

Fig. 18. Abdomen.

Fig. 19. Fifth foot of female.

Fig. 20. Antennule.

Fig. 21. Jaw.

Fig. 22. Maxilliped.

Fig. 23. First swimming foot.

Fig. 24. Fourth foot.

Fig. 25. Male antenna.

Fig. 26. Fifth feet of male.

longer than the remainder and projects laterally into two strong spines; second segment very short, invaginatedly concealed in the preceding. Caudal stylets short but nearly as long as the preceding segment,

ciliated on the mesial aspect, setae strongly pectinate. Antennae extending to or beyond the end of the stylets, purple-tipped, 25-jointed. The antepenult joint of the right male antenna with a curved hook. The fifth foot of the female with very short inner ramus which is more or less distinctly two-jointed or simply attenuated beyond the middle, armed apically with two or more spines and setae. External branch 3-jointed, third segment obvious and armed with one long and one shorter spine. Claw rather straight, armed for the middle third of its concave aspect with sharp teeth. The right fifth foot of the male has, on the outer ramus, a long sickle-shaped claw with few teeth or none, it being nearly as long as the remainder of the leg. The penult joint is long and bears a long thick spine which is slightly curved and may be dentate and is affixed at a point of the segment one fourth its length from the end. The basal joint of the outer ramus is very short and, like the next following has a lateral hyaline plate. The inner ramus is very short and 1-jointed. The second protopodite segment of the left foot is nearly as long as that of the right, the inner ramus is 1-jointed and simply ciliate at the end. The apical segment of the outer ramus is acute and bears a short, ciliated, conical process and a minute spine apically as well as a ciliated internal lamina. The preceding joint also has such a lamina or a patch of short spinules upon a protuberance.

Color pellucid, with purple upon the tips of the antennae and caudal stylets.

Length of female, 1.4—1.6 mm.

Waters about Albuquerque New Mexico very abundant.

Diaptomus novomexicanus n. sp.

(Figures 27—29.)

A species of moderate size, rather robust, with the greatest width of the thorax near the middle. Last two thoracic segments distinct, the last with two small spines. First abdominal segment very long, much exceeding the remainder. Second segment short. Stylets about as long as the preceding abdominal segment. Antennae reflexed reach to the base or end of the stylets, 25-jointed. Antepenult segment of right male antenna with a hyaline lamina which does not extend the entire length of the joint and ends in a rather short scarcely hooked process distad. The outer ramus of the fifth feet is obviously three-jointed, the apical joint being small and armed with two subequal spines. A small spine is inserted near the base of this joint. The claw is curved and dentate near the apex. The inner ramus is as long as the basal joint of the outer ramus, 1-jointed, and armed at

the apex with two subequal spines. The inner rami of the fifth feet of the male are both 1-jointed, acute and minutely ciliated. The apical claw of the right foot is long and slightly curved. The accessory spine is weak and inserted one-third the length of the second

Fig. 27.

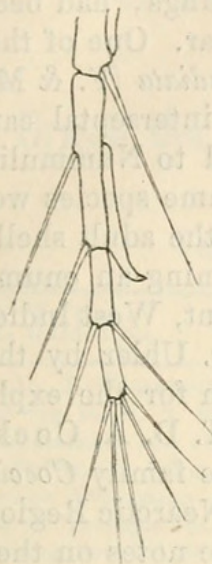


Fig. 28.

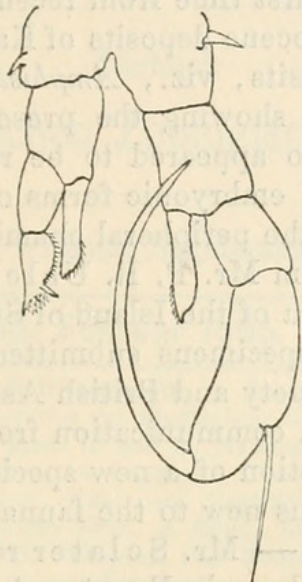


Fig. 29.

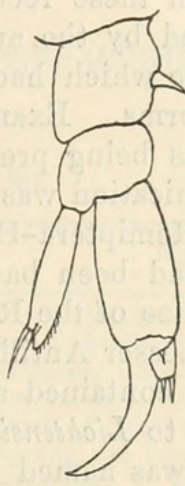
Fig. 27. *Diaptomus novomexicanus*. End of right male antenna.

Fig. 28. Fifth feet of male.

Fig. 29. Fifth foot of female.

joint from its end. The apical joint of the outer ramus of the left foot is armed with a cushion of short spines and two longer ones and also bears a ciliated lamina internally. Length of female, 1.1—1.2 mm.

II. Mittheilungen aus Museen, Instituten etc.

Zoological Society of London.

15th January, 1895. — The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of December 1894, and called attention to two Tapirs recently deposited in the Society's Gardens, which he believed to be referable to Dow's Tapir (*Tapirus Dowi*) of Central America. — Mr. P. Chalmers Mitchell, F.Z.S., exhibited and gave an account of a tibia and other bones of an extinct bird of the genus *Aepyornis* from Central Madagascar, which had been lent to him for exhibition by Mr. Joseph H. Fenn. With these bones was associated a skull of a species of *Hippopotamus*. — Prof. G. B. Howes, F.Z.S., exhibited and made remarks on the photograph of an embryo of *Ornithorhynchus*. — The Secretary exhibited, on behalf of Mr. R. Lydekker, a life-sized drawing of *Idiurus Zenkeri*, a new and remarkably small form of Flying Squirrel from West Africa, recently described at Berlin. — Lord Lilford, F.Z.S., sent for exhibition the skin of a Duck, believed to be a hybrid between the Mallard (*Anas boschas*) and the Teal (*Querquedula crecca*), that had been caught in a decoy in Northamptonshire. — The Rev. T. R. R. Stebb-



Herrick, C. L. 1894. "Microcrustacea from New Mexico." *Zoologischer Anzeiger* 18, 40-47.

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