

Radial formula, D. VII. 17; A. 12; P. 15 all simple; Br. VI. The head is depressed and enters the length minus the caudal fin, three times. Orbit large one-fifth length of head, and twice the width of the frontal interspace. Greatest depth (at first anal ray) 6.75 times in length less caudal fin. Anal commencing opposite the third ray of the second dorsal. Lateral line deflexed opposite last ray of second dorsal. The recurved preopercular spine strong, the decurved small and obtuse. Palatine teeth present; end of maxillary reaching line of pupil. Isthmus as wide as length of muzzle and orbit to front line of pupil. Skin everywhere smooth.

Total length .084; do. less caudal fin .069; do. to anal .042; do. to first dorsal .031; of head .022; width at maxillaries distally .0125; at preopercular spines .0185.

From Beaver river S. W. Utah. The other species of the Rocky Mountains, *U. punctulata*, Gill, has, according to that zoologist a much wider head, especially in the frontal region. This character is well exhibited by specimens in Dr. Hayden's collections.

Dedicated to Lieut. Wheeler, Director of the U. S. Survey west of the 100th Meridian.

ON THE ZOOLOGY OF A TEMPORARY POOL ON THE PLAINS OF COLORADO.

BY PROF. E. D. COPE.

(Read before the American Philosophical Society, March 20th, 1874.)

Some years ago, Thomas Kite, of Cincinnati, observed an Entomostracous crustacean swimming in a temporary pool of rain-water. A species no larger than a pin's head is abundant in horse-troughs, springs, &c., and belongs to the genus *Cypris*. That observed by Mr. Kite is much larger, and is not known to occur in flowing water. It was named *Limnadella Kitei* by Girard. I have since observed it in Pennsylvania, in rain puddles standing in the ruts of roads in woods; and in New Jersey Dr. Knieskern found it in similar pools alongside of roads in the open country. The wonder naturally is, how strictly aquatic branchiferous animals can be propagated under the circumstances, and how they can be distributed from place to place. A similar species has been recently observed by M. Tissandier in pools in the valley of the Seine. These were left by a flood of the river, and before drying up became populous with a species of the Cyprididæ.

The most remarkable examples of this kind are, however, to be observed on the plains of Kansas and Colorado.

Here rains create temporary pools in depressions of the surface, which may remain for a few days or weeks, but are all dried up by the end of September. Nevertheless, some of them at least swarm with a population of branchiferous crustaceans, worms and larvæ of insects, with the adults, which, in their developed state, come to the surface for air, or live on

the adjacent banks. Observations on a pool of this kind determined sixteen species which lived in or on the water, which had an area of thirty feet by fifteen, and a depth not exceeding a foot. Three of the species were worms, six insects, one arachnid, and eight crustaceans.

The insects were a bluish fly, with a pale bloom, which ran rapidly over the surface, aiding its progress by its wings; a slender beetle, that clung to the submerged stems; two species of actively swimming water-beetles, one beautifully varied with white; and a sluggish, pale-green species, which swam readily. There was also that cosmopolitan boatman who swims on his back, the hemipterous notonecta. One of the worms was delicately striped with lines and rows of dots, another was soft and jointless, and could contract itself into a mere lump or extend itself to considerable length. It was no doubt a planarian, and was of a pea-green color. Another planarian was white, and some of its internal organs showed as a milk-white zigzag figure through the body walls. It swam freely through the water. Of the crustaceans, four were the shelled *Cyprides*. One was very small, short oval, and green; another, still small, was a long oval, straw-colored, and covered with hair; a third was large as a small pea, almost globular, and brilliant green. It was very abundant, swimming in twos and threes among the grass-stems or near the surface. The fourth was a gigantic species, large as the thumb-nail, and of a pale-reddish orange color. It was frequently observed in encounters with others of its species. The water was alive with shoals of what appeared to be at first sight the translucent fry of some fish. On closer examination they proved to be elongate crustaceans allied to the *Branchipus*, their delicately-fringed gills hanging suspended from the hinder segments of the body. They were covered with a jointed coat of mail, and darted about with great activity. They were elegant creatures, with a crimson tail setting off the glass-like clearness of the body. The most singular of these forms is the *Cyclops*. It resembles superficially the king crab of our sea-shores, truly, indeed, in the great buckler or shield covering the head and thorax. It has a single elevation on the middle of the top of the head for two eye windows or corneæ, and an inferior pair of widely-separated eyes look downward to the bottom of the water. The tail or body is soft, jointed, and worm-like, and bears a pair of feelers at the end. These curious creatures swim on the bottom, chasing each other here and there, resembling in their motions and form diminutive cat fishes. Some other forms were minute crimson, and strangely formed creatures. The common arachnid was a round-bodied *Hydrachna*, or water-tick, of a bright red color.

This population evidently has a short life, and it is probable that their existence is only secured by the long preservation of the eggs in the bottom of the dry ponds, which may be readily carried from place to place by winds during the dry season.



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