development of the Gammarus eggs takes place in much shorter time, and are thus not carried for so long a period by the mother-animal compared with Eucrangonyx. The young ones are probably born in May, July and September in the latitude of the Great Lakes. Gammarus limnaeus is said to range in the United States from Maine to Utah, and has formerly been recorded from Lakes Superior, Michigan and Georgian Bay. It has also (Pearse, 1913) been recorded from lakes in the neighborhood of White Horse, Yukon Territory and Rampart House, Alaska (Porcupine River). I have (beside the Arctic ones mentioned above) a number of hitherto unpublished records from additional localities, which I give here, arranging them from east to west .-

Observed (animals escaped) in pool at Tadousac, P.Q., September 6th, 1919; young individuals.

Stream-pool between St. Lawrence River and Diamond Hill, Quebec City, September 19, 1919; many specimens (4-9 mm. long.)

Bight at Alexandra Bay, N.Y. (Thousand Islands), September 1st, 1919; many specimens up to 10 mm. long (females with eggs.)

I have not yet found this species around Ottawa, though the two smaller freshwater-amphipods, (Eucrangonyx gracilis, and Hyalella knickerbockeri) are common here; but Prcf. E. M. Walker, of Toronto, has sent me some ( $\frac{1}{2}$  doz.) full grown specimens of this species collected near Whitefish Creek, Lake Simcoe, Ont., on June 17, 1917.

From Manitoba I have before me ten specimens, full grown, about (2 cm. long) collected by E. Criddle, at Treesbank, (Assiniboine River), November 21, 1917; and two specimens (1 smaller, one almost full grown), from Cross Lake (about lat.  $54 \frac{1}{2}^{\circ}$  N.) collected by F. J. Alcock in the summer of 1919.

I have no records of this species from Saskatchewan, though it undoubtedly occurs there, having been found both in Manitoba and in Alberta.

From Alberta I have before me twenty-seven specimens, about 2 cm. long, from Dodds Lake, near Edmonton, collected by a university student there on March 8, 1919 and sent to me by Dr. Mc-Lean Fraser of Nanaimo, B.C.

Also  $\frac{1}{2}$  dozen specimens from Miquelon Lake, Alberta (about lat. 53° N.), collected on September 30, 1918, by R. M. Anderson, of Ottawa.

Many specimens (mostly full grown) from a marsh in Cabin Lake Creek, Jasper Park, collected by W. Spreadborough, on Aug. 31, 1918.

Also  $1\frac{1}{2}$  doz. specimens from the plain near Red Deer and Battle Rivers, east of the foothills, Alberta (about lat. 53° N.) collected by J. B. Tyrrell, June to September, 1885.

From British Columbia I have examined the fol-

lowing specimens :---

Three large ones from Sink Lake, near Stephen, E. Kootenay county, B.C., September 26, 1883, J. B. Tyrrell, collecter.

Half a dozen from Beaver Pond in valley of Kish-e-nek-na creek, (Flathead River, near International Boundary, B.C.) August 27, 1883, J. B. Tyrrell, collector.

We now come to the third family of freshwateramphipods, namely the Orchestiidae, represented by only one species on this continent—the common Hyalella (allorchestes) knickerbockeri, Bate. The other species (H. azteka Lauss, H. dentata, Smith, H. inermis Smith) described formerly have proved to be only varieties. In addition to the characters given for the family, (p. 128) this amphipod is immediately recognized by the presence of a curved spine projecting backwards from the middle of the posterior margin of each of the first two abdominal segments, a character which can be seen with the aid of a strong magnifying glass, and reminds one strongly of certain marine (especially arctic) amphipods.\*

The biology of Hvalella knickerbockeri has been studied by various naturalists and a rather full account of it has been given by H. H. T. Jackson (1912). He says it is a littoral form, only occurring to the depth of about one fathom of water in larger lakes, and that it prefers sluggish streams and lakes, etc., with much vegetation. He states that it feeds almost exclusively on protozoa and algae, which it gets by swimming or crawling. He found it was more active at night than during the day time, also that there was much variety in its color, and that the latter was not solely due to food in the intestine (compare Eucrangonyx gracilis, p. 129). The largest specimen he observed was 7.6 mm. long; the females average less than the males in length, but are deeper in the body. According to the author quoted, the species breeds throughout the year, but especially during the summer; while thus engaged the male carries the female, though releasing his hold when the moulting takes place. Soon after copulation the eggs pass into the ovarial sack (brood-pouch) of the female, but they take almost a month to hatch. Jackson paid particular attention to the moults. He found, that there is a varying period (1 to 5 weeks) between the moultings, and that each moult begins with a transverse split in the forepart of the body. Contrary to what is the case with many crustacea (for example the cray fishes) the moulted skins are not eaten by these amphipods after being cast. My own observations on the biology of this animal agree with those of Jackson except that he says it does not occur in temporary \*Shape of Hyalella is more robust and rounded than Eucrangonyx of corresponding size (see p. 129).