

### APPENDIX III.

## NOTE ON THE OCCURRENCE OF *BUENOA ELEGANS* (FIEB.) (NOTONECTIDAE, HEMIPTERA-HETEROPTERA) IN THE EARLY POSTGLACIAL SEDIMENT OF LYD HYT POND.

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THE specimen here reported is put on record because it illustrates the possibility, in favorable cases, of recognizing the specific identity of very fragmentary remains of aquatic insects preserved in undried lake sediments. At the present time most of our knowledge of the post-glacial biological colonisation of glaciated North America is derived from a study of flowering plants, molluscs and vertebrates. It seems probable that much supplementary information could be obtained from insect remains if all investigators studying lacustrine microfossils make an effort to determine, or have determined, such insect genitalia as may occur in their preparations. My best thanks are due to Dr. E. S. Deevey, for an opportunity to report upon the present specimen.

#### *Buenoa elegans* (Fieber).

*Anisops elegans* Fieber 1851. Rhynchotographien, p. 61. (The *Anmerkung*, translated by Hungerford as part of the description of this species, clearly refer to the genus as a whole.) Type locality given only as "Aus Amerika."

*Buenoa elegans*—Bueno 1908. Journ. New York Ent. Soc. 16, p. 238. Hungerford 1920. Kansas Univ. Sci. Bull. 11, p. 176. Bare 1928. Kansas Univ. Sci. Bull. 18, p. 268.

*Locality*—Lyd Hyt Pond, Branford, New Haven County, Connecticut. Boring LH-3. (Deevey)

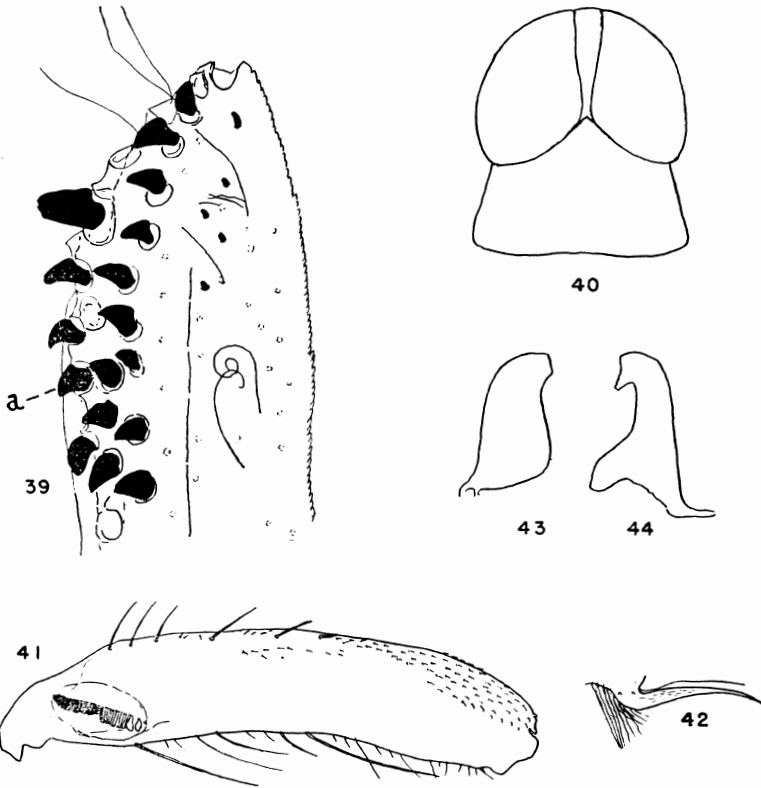
*Horizon*—Eighteen feet below the present bottom of the pond; this level falls in B-1 of Deevey's chronology, during the later part of the short and supposedly xerothermic pine period, just prior to the establishment of the oak-hemlock forest. A detailed discussion of correlations with other sections is given in the first paper of this series.

*Material*—One individual represented by the greater part of the external female genitalia. The whole of the right ovipositor valve is preserved, though some of its apical teeth are missing, the base of the left valve and one acrocercus are also present. The almost complete right valve alone requires consideration.

The ovipositors of the genus *Buenoa* have been discussed by Bare, who finds considerable interspecific variation. Unfortunately Bare did not determine all his material specifically and gives only counts of the number of teeth on the edge and the side of the valve, without indication of their detailed arrangement, except for an excellent figure of the organ in *B. margaritacea* Bueno. I have examined *B. margaritacea* from Kansas, *B. macrotibialis* Hungerford from Wisconsin, *B. arizonis* Bare from Arizona and *B. elegans* Fieber from Massachusetts. It is clear that the ovipositors of all these species show slight but characteristic differences.

In *B. margaritacea* and *B. arizonis* the teeth on the edge of the valve are arranged apically in two rows, in the middle of the valve the members of the two rows tend to alternate, becoming a single row proximally. The four or five small spines on the side of the valve appear to be grouped more apically in *B. margaritacea*, arranged in a more extended line in *B. arizonis*. The lateral teeth number 33-37 in the first species, 33-35 in the second and so do not permit a separation. In both species the tooth row is 0.52-0.53 mm. long.

In *B. macrotibialis* and *B. elegans* the same two rows of marginal teeth are present apically, but the outer row of larger teeth is not continued down the shaft, being replaced by a proximal intermediate row which ends distally between the inner row and the proximal part of the outer row. This arrangement implies that for a short distance, proximal to the fifth tooth of the outer row, counting from the apex, there are three longitudinal rows, and the teeth of this region can be aligned to form more or less transverse rows of three members, as at *a* in Plate III, Fig. 39. Comparison of the ovipositors of the two species indicates that although both show the above arrangement, the tooth row of *macrotibialis* is longer (0.63 mm.) than that of *elegans* (0.49-0.50 mm.) and comprises more teeth (40-41, Michigan, Bare; 42-45 Wisconsin). The fossil ovipositor shows the triple row below the fifth outer tooth has 35 teeth or tooth-bases and a tooth row 0.49 mm. long. It may therefore be assigned with considerable confidence to *Buenoa elegans* Fieb.; careful scrutiny fails to indicate any appreciable differences between the fossil and recent specimens of the species. No specimens of *B. limnocastoris* Hungerford or *B. scimitra* Bare have been studied; these species are larger than *B. elegans* and since detailed study has revealed diagnostic



## EXPLANATION OF PLATE III.

Fig. 39. *Buenoa elegans* (Fieb.) apex of right gonapophysis, fossil female from Lyd Hyt pond ( $\times 225$ ).

Fig. 40. Recent male from Nonamasset Is., Mass., head and pronotum ( $\times 25$ ).

Fig. 41. Anterior femur of same ( $\times 75$ ).

Fig. 42. Spine of seventh abdominal segment of same ( $\times 75$ ).

Fig. 43. Right paramere of same ( $\times 75$ ).

Fig. 44. Left paramere of same ( $\times 75$ ).

characters in all the forms examined, it seems safe to exclude them. In his table giving the number of teeth in the ovipositor valves of various species of *Buenoa*, Bare gives entries for undetermined specimens from three Michigan localities. The males from the same localities are referred to *elegans* (?). The number of teeth on the ovipositor valves is given as 30-40, which accords with my observations; there is, however, consider-

able diversity in the male structures, suggesting that more than one species may be present. It has accordingly seemed desirable to figure (Plate III, Fig. 40-44) the characteristic structures of a male taken with the females used in comparison with the fossil in order to fix the form, presumably the true *elegans* Fieber, to which the fossil is referred. *Buena elegans* is recorded in eastern North America from New Jersey to Maine. Bare's Michigan specimens suggest that a critical reevaluation of the distribution is desirable.

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