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THE PLEUROCERIDAE OF THE PACIFIC COASTAL
DRAINAGE, INCLUDING THE WESTERN
INTERIOR BASIN*

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THE Pleuroceridae of the Pacific slope of the United States are confined to a single genus, *Goniobasis*. On the basis of differences in sculpture, the shells fall into two groups, but since in one of the groups sculpture varies as environment varies—tending to be strong and conspicuous in main streams and nearly absent to altogether absent in headstreams and springs—the distinction may be worthless. The character of the operculum is apparently alike in all colonies, and such radulae as have been seen show no important differences. In 1935 Mr. Junius Henderson named and described nine new species and subspecies of the Pacific province. He established distinctions upon size, color, strength or weakness of sculpture, and the degree to which sculpture has persisted with the growth of the mollusks. These are differentiations, it seems to me, which mark off local races from one another rather than differences among species. Until a system of nomenclature shall have been devised that can deal with peculiarities of groups, clusters, or colonies, each by itself, it has appeared wisest to keep to the

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course followed in the treatment of the Pleuroceridae east of the Rocky Mountains.

GROUP OF *Goniobasis occata*

Goniobasis occata (Hinds), 1844. Sacramento and San Joaquin rivers, California.

Goniobasis acutiflora Stearns, 1890. Shasta and Lassen counties, California.

Goniobasis acutiflora siskiyouensis Pilsbry, 1899. Siskiyou County, California.

Goniobasis acutiflora pittensis Henderson, 1935. Fall River, Shasta County, California. Henderson says that with the type was "associated . . . two nearly typical specimens of *acutiflora*." The statement serves to redirect attention to the fact that in any genus of the Pleuroceridae sharp distinctions are wanting as between species and subspecies and that these nomenclatorial terms do not convey the meaning they do as in, for example, the terrestrial Polygyridae.

GROUP OF *Goniobasis plicifera*

Goniobasis plicifera (Lea), 1838. Larger streams of Oregon and Washington.

Synonyms:

Goniobasis plicifera oregonensis Tryon, 1865.

Goniobasis plicifera bulimoides Tryon, 1865.

Goniobasis silicula (Gould), 1847. Streams of Oregon and Washington. Certain shells of northern California come within the description of this species. Shells also have been seen that are on the borderline of *plicifera* and *silicula* and could justifiably be assigned to either species. Material received from five localities in Oregon and Washington, without attempt at separation on the part of the collectors, was made up in each instance of forms of the two species so-called. Such overlappings have been explained as examples of hybridism. Equally plausible is the hypothesis that a precise demarkation between the species does not exist.

Synonyms:

Melania Shastaensis Lea, 1856.
Melania rudens Reeve, 1860.

Goniobasis rubiginosa Lea, 1862.
Goniobasis Bairdiana Lea, 1862.

Goniobasis nigrina (Lea), 1856. Head streams and river tributaries of Oregon and northern California. Shells taken in the interior drainage basin, Washoe County, Nevada, may possibly belong here. In a few colonies individuals have vestiges of plicate sculpture, but otherwise what is here called *G. nigrina* is reduced to the very simplest terms of rounded whorls, small apertures, and conic configurations of inconsiderable diameter. The snails are to be considered end products, possibly of different stocks, or reactions to harsh environments. Some differences in radulae have been observed as between specimens of California and others of Nevada, but in each are indications of depauperization, and the differences may represent only degrees of biological impoverishment.

SPECIES INCERTA

In the *Nautilus* (48 [1935] : 94-99, 130-34), Henderson has described *Goniobasis hemphilli*, *hemphilli dallesensis*, *hemphilli maupinensis*, *yraekaensis*, *yrekaensis obscura*, *orickensis*, *coquillensis*, and *chacei*, besides *acutiflora pittensis* aforementioned. The recognition of the distinctions rests, it seems to me, upon the value of characters that are evanescent, have varying emphasis or conspicuousness, or are carried more or less from juvenility to mature stages. Nearly every colony of *Goniobasis* has some sort of ecological imprint marking it off from other colonies. That this is genetic and warranting specific and subspecific discriminations appears, at least at this stage of biological knowledge, open to debate.

Goniobasis columbiensis Whiteaves, 1905. Described as from the headwaters of the Columbia River, East Kootenay, British Columbia. Attention to its likeness to *G. livescens* (Menke) of the St. Lawrence basin was directed by Whiteaves. Types have been examined. Shell characters and opercula are identical with those of *livescens* of Lake Erie. The belief is that shifting or misplacement of labels occurred. Dr. Carl L. Hubbs directs my attention to the fact that certain fishes east

of the Mississippi River occur in the Kootenay district and raises the question as to whether this might also be true of eastern American Pleuroceridae. It would be unsafe to deny this dogmatically, inasmuch as matters of molluscan distribution are in flux, especially since white men have taken a hand in rearranging dispersal. I can only register the circumstances: *columbiensis* is indistinguishable in shell and operculum from *G. livescens* of exposed positions of Lake Erie, it is totally unlike the goniobasic complex of the Pacific slope, and only one unchallengeable instance of discontinuous distribution under natural conditions is known in the family—ignoring the one of the interior drainage basin. The instance is in the region of underground drainage of Kentucky where, indeed, subterranean stream piracy may have brought the occurrence about.