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NOTES ON *PHYSA TRITICEA* OF LEA; ITS RELATIONS AND COMMENTS ON THE VARIATION, Etc., OF *PHYSÆ*.

BY ROBERT E. C. STEARNS.

THIS California pond snail was described by Dr. Lea in 1856, from specimens collected by the late Dr. John B. Trask, in Shasta County. It was afterwards collected by Dr. J. G. Cooper inferentially in "South and East Oregon," as he adds these localities in his "Geographical Catalogue" to that previously given. In May, 1883, and subsequently, I detected it in springs in the vicinity of Auburn, in Placer County, at an elevation of about 1,300 feet, and collected at first between sixty and seventy specimens, subsequently more. It seems rather to have escaped the attention of collectors; or if found, has perhaps been labeled under some other name; as like nearly all, if not all, of the alleged species of *Physa*, it exhibits more or less variation when numbers of individuals are compared, even when such individuals are a part of the same colony.

The form to which Dr. Lea gave the name of *triticea* is, on the whole, rather persistent, and adheres quite closely to the type, as given in Binney *(figure 160); it is thirty-four hundredths (.34) of an inch in length. My specimens of the same length agree closely and generally with the figure, though the larger individuals, forty-six hundredths (.46) of an inch in length, exhibit some differentiation in the twist of the columella when compared with the smaller ones.

The largest are hardly typical, and though collected very near (within a half mile of) the smaller and more nearly typical forms,

* L. and F. W. Shells of North America, Part II, p. 94; S. I. Coll., No. 143.

were found living in one respect, at least, under a different condition. Without entering into a general revision of the North American *Physadæ*, a task which, sooner or later, will be required, I will state that I regard *P. triticea* as simply an immature aspect of the almost universally distributed *Physa gyrina*, and the larger specimens collected by me at Auburn, though smaller than the average of adult *gyrina*, connect the two.

The conditions under which the Auburn lots occur are as follows: The smaller, which would surely be placed with *triticea*, were collected close to springs, where the flow of water at its maximum is small, and its catchment is limited and confined in small hollows. A part of the year these springs must be quite dry, though most of the time yielding a feeble trickling stream. Colonies of *Physæ* became established hereabouts, but when mature, attain a size hardly equal to that of an ordinary *P. gyrina*, minus the final whorl, and showing the characters that *P. gyrina* exhibits from the apex down to and inclusive of the penultimate whorl. It is an arrested, undeveloped form, equal to *P. gyrina* adolescent. The larger Auburn specimens, though still exhibiting much of the aspect of *triticea*, indicate, as before implied, their relation to *gyrina*, and were collected where the flow of water is generally permanent and the quantity much greater than in the other instances, but still where there is not even a permanent pool, and no runway of water that could be called a permanent brook or streamlet.

The geological character of the region is a slate that is folded and tilted and tipped; it seems much more favorable to the formation of small springs than to permanent brooks and flowing streams, though the latter are occasionally met with, being fed by the melting snows of higher elevations.

The surface of the pond snails, which authors describe with a nicety that would be commendable if it were not so often absurd and embarrassing, varies exceedingly in texture, sculpture and color; adolescent individuals of the same species or colony may be pellucid, and mature ones opaque; young shells may have a smooth surface, and old ones exhibit growth lines; the surface in some may be even, in others malleated, and so on; and color is modified if the specimens, when collected and placed in water, are allowed to remain until maceration has reached a putrid stage, when the interior of the shell becomes blackened either by the adherence of decayed matter or by chemical discoloration; the membranaceous composi-

tion of the shell is also impaired and the limey portion made more conspicuous through its general bleaching effect and whitening of the callus of the columella. Mr. Tryon's *Physa politissima*, collected by Rev. J. Rowell, at Sacramento, and described and figured in Am. Journ. Conch., Vol. I, 1865, is probably one aspect of Lea's *P. triticea*. It is from a lower station, with an elevation variously stated as from thirty-one to eighty-two feet above sea level, and within the same drainage system.

The summing up of the foregoing leads to the conclusion that the first-named species (that made by Dr. Lea) is but a dwarfed and arrested aspect of *P. gyrina*, and Mr. Tryon's species is but another facies of the same.

Of the number of species that have been made upon characters that are simply those of adolescence, it would be interesting to know. Doubtless a great many, and not only among the fluviatile and lacustrine forms, but among marine forms also. This fact almost daily presents itself where one's routine work is the selection of specimens or examples for a great museum, and the determination of species from a great mass of material. Sometimes one is led to think that it is a pity, either that animals are not born fully grown, or that those who describe them do not bear in mind the fact that mollusks, etc., like men, have to advance by gradual growth from babyhood and the various stages of adolescence to maturity.

HELIX NEMORALIS IN VIRGINIA.

BY H. A. PILSBRY.

The *H. nemoralis* does not appear to have been naturalized in America except at Burlington, New Jersey, where it was introduced by Mr. W. G. Binney, many years ago. A short time since, I received a parcel of *nemoralis* shells from Prof. Jas. H. Morrison, of Lexington, Va. In response to a letter of inquiry Prof. Morrison gives the circumstances of its introduction as follows:

"The first specimen was found in the grounds of the Virginia Military Institute, in 1886, and was sent to Prof. Baird, who called it 'Helix hortensis,' stating that this was a new locality. A few days afterwards I found quite a number of specimens and sent part of them to Mr. Tryon, who said they were 'Helix nemoralis', and gave all the necessary information to establish this point. I found



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