

ation. These he perforated
 gs to them by wooden pegs
 ie evident that the mud and
 o excess of light, were inimi-
 es having the form of floating
 attached beneath, were tried.
 l merely tying the cuttings to
 st plan there was too much
 ht. Buccich first constructed
 s crossing each other at right
 his was so far successful that
 des to the sea, and assumed
 made a modification, consist-
 e forms the bottom and the
 rallel one over the other at a
 some 11^{cm} apart. In the space
 placed as ballast. On the top
 lanks holes are bored at 12^{cm}
 not simply on the apparatus,
 o the holes of both boards.
 mon Spanish cane was used,
 the attacks of the pile-worm.
 ed through at a distance of
 each stick three sponge cut-
 e that they should lie over the
 sticks were thrust, and each

be pegged only with wooden
 e for piercing. When adopt-
 uch an instrument is not suit-
 ould be required to make an
 g and squeezing causes a loss
 is the first rule that governs
 ch bored the cuttings with an
 id, fixed to a vertical wheel
 hile one hand quietly presses
 her turns the wheel. In a few
 ; the bore-hole is clean, the
 does not run out. When a
 end is thrust into one of the
 driven through the slit.
 sticks, carrying three cuttings
 modate 144 cuttings. During
 anging of the sponges is quite
 d gently moistened with sea-
 apparatus may be most conve-
 means of a small anchor. The

If the cuttings hold fast after three or four weeks, the propaga-
 tion is secure. A characteristic feature of the cuttings is their ten-
 dency to assume a round form. To facilitate this on every side is
 the chief aim of Buccich's system of supporting on sticks. As to
 the rate of growth of the cuttings within a certain period no rule
 can be given, on account of the varying conditions.

Buccich remarked that the cuttings in the first year were two
 or three times as large as they were originally; he further re-
 marked that the cuttings grew better in the first and fourth years
 than in the second and third, a point evidently regarded as doubt-
 ful by Dr. Marenzeller; and it would seem that though some spe-
 cimens may have attained a considerable size in the fifth year of
 transplantation, still a term of seven years is necessary to produce
 a marketable and profitable article.

Dr. Marenzeller also mentions the fact that besides being beau-
 tifully formed and rounded, the cuttings retain these qualities, and
 perfect health, with increasing size.

In conclusion, Buccich proposes the question whether the un-
 dertaking can be made profitable, and answers it in the affirma-
 tive.

Dr. Marenzeller concludes that the propagation of sponge by
 cuttings is not to be recommended to people without capital, but
 is more suited to the attention of a capitalist, or an association of
 capitalists, and to be conducted on a large scale.—*Journal Royal
 Microscopical Society.*

THE CIRCUMPOLAR DISTRIBUTION OF CERTAIN FRESH-WATER
 MUSSELS, AND THE IDENTITY OF CERTAIN SPECIES.—In a recent
 paper¹ suggested by the occurrence of the remains of fresh-wa'er
 mussels (*Anodons*) associated with other fossils in the sedimentary
 strata of the Carson City prison yard, read by Dr. Stearns before
 the California Academy of Sciences, the author in an elaborate re-
 view of the subject, expresses the opinion that the European
Anodonta cygnea + *Anatina*, should be added to the circumboreal
 list with other fresh-water mollusks, including *Margaritana mar-
 garitifera*, among the lamellibranchs, and *Limnæa stagnalis*, *L.
 palustris*, and *L. auricularia* (as represented by *L. ampla*); *Physa
 hypnorum* and *P. fontinalis* (by *Physa heterostropha*), among the
 gasteropods.

With the exception of *A. cygnea*, the above species have long
 been regarded by the most conservative authors as circumboreal
 in their geographical range.

The author also considers the Eastern American species, *Ano-
 donta imbecilis* Say and *A. fluviatilis* Lea, from New England
 waters, inclusive also of *A. implicata*, from the same region as
 identical with *A. anatina* or some of the numerous varieties of

¹ "On the History and Distribution of the Fresh-water Mussels and the Identity of
 certain alleged species." By Robert E. C. Stearns. Proc. California Acad. Sciences,
 November 20th, 1882.

A. cygnea, of which Dr. Lea has listed no less than *one hundred and six synonyms*. As *A. anatina* is shown to be but a varietal or conditional aspect of *A. cygnea*, therefore these alleged American species are regarded as belonging to *A. cygnea*.

Dr. Stearns also includes in this identity with *A. cygnea*, the West American forms known heretofore as *A. nuttalliana*, *A. wahlamatisensis*, *A. oregonensis*, and *A. californiensis*; these are traceable to *Cygnea*, through its *Anatina* aspect or condition, as well as through others of the many varieties of *Cygnea*, which have led to the extensive synonymy above referred to.

Specimens of *A. anatina*, from Regent's park, London, laid upon valves of *A. californiensis*, so-called, from Owen's river, California, he found to agree exactly in incremental lines and in final or peripheral outline.

He further shows how specimens of *A. cygnea*, at a certain stage of growth, would, if collected at the time when the shell had reached said stage, have been called *Anatina*, but not having been collected until said stage of growth had passed, became by subsequent growth *Cygnea*. The absurdity of regarding species thus made as valid, is self-evident.

The fresh-water mussels of the Colorado desert are associated with contemporaneous molluscan forms like *Physa*, *Planorbis*, *Tryonia* and *Amnicola* in the Carson City prison-yard, the same form (of mussel) is found with evidences of higher but extinct animal organizations like that of *Elephas*, a species of horse, a deer, a wolf, a wading bird, possibly the footprints of a human being, but more likely the tracks of a great sloth like *Mylodon*. The molluscan remains are identified by Dr. Stearns as belonging to *Sphærium* and *Physa*. The fresh-water mussels are the same as are now found living a few miles away in Washoe lake, and specimens from this lake are exactly like those from Bear river and Utah lake in Utah Territory, and further the specimens from these various points are closely like the *Anatina* aspect of *A. cygnea*.

The paper presents also reviews past and present geological and physico-geographical conditions, and assigns the Carson footprint beds to the uppermost tertiary.

The general tenor of the paper, which is quite lengthy, sustains Professor Weatherby's view as to the earliest fresh-water mollusca being lacustrine.

ON THE EASTERN RANGE OF UNIO PRESSUS (LEA).—This species was originally described by Dr. Lea, and figured (in *Trans. Am. Phil. Soc.*, Vol. III, 1830, pp. 450-451, plate XII.) under the name of *Symphynota compressa*, from Ohio, and also from Norman's Kill, near Albany, where it was found by Dr. Eights. It has since been found in the northern canal at Troy, N. Y., by T. H. Aldrich; at the outlet of Owasco lake, by Dr. Jas. Lewis; and in a small