

## Notes &amp; News

## *Busycotypus (B.) canaliculatus* in San Francisco Bay

BY

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Although the channeled whelk has been found sporadically in San Francisco Bay presumably ever since 1938, it is only within recent years that it seems to have become relatively abundant, at least in certain localities. The first observation is attributed by Dr. Leo G. Hertlein of the California Academy of Sciences to an unnamed collector who is alleged to have obtained living specimens of this species while dredging for "oyster shell", a dietary supplement for chickens, in 1938. This report is quoted both in Puffer and Emerson (1954) and in Hollister (1958), from a personal communication by Dr. Hertlein. However, the earliest recorded specimens (three) in the collection of the California Academy were obtained by Rogers on December 20, 1950, "at about the foot of Gilman Street" in San Francisco (2 on map, textfig. 1). Four additional specimens in the same collection were obtained by C. H. Roof at Coyote Point (4 on map, textfig. 1) in San Mateo County, on March 27, 1954. In the collection of the Geology Department at Stanford University is a specimen which was dredged off Bay Farm Island (1 on map, textfig. 1), Alameda County, by P. J. Gambetta in February 1948. This seems to be the earliest record of the species in San Francisco Bay, as far as I have been able to ascertain. It seems logical to suggest, therefore, that the year 1938 is either a typographical error or an error of memory and that actually the year 1948 represents the first occurrence of the species. In the collection of the Department of Zoology at the University of California in Berkeley, there are additional records, as follows:

A young specimen from Point Bluff (3 on map, textfig. 1), Marin County, collected by Earl Barnawell on June 14, 1953.

A mature specimen snagged with a fishhook off Belmont Slough (5 on map, textfig. 1), San Mateo County, by H. A. Dalton on June 29, 1958.

A mature specimen brought in alive by Mr. Charles Barry, from Alameda (7 on map, textfig. 1), Alameda County, in May 1960.

While all the instances of observations recorded thus far concern only one or very few individuals, there are now available also observations on larger numbers of individuals. On December 22, 1958, Miss Laura Cantrel of Oakland collected 26 specimens at the foot of San Mateo Bridge (6 on map, textfig. 1), San Mateo County. During the year 1961 two members of the Northern California Malacozoological Club, Mrs. Wanda Martin of Albany and Mrs. Verna Wegner of El Cerrito, collected over 100 specimens, ranging from very small to apparently fully mature specimens, near Alameda (7 on map, textfig. 1) in Alameda County. These two collectors also picked up several strings of egg capsules. On November 16, 1961, Mrs. Martin brought two living whelks and one egg string to the Department of Zoology for exhibit in the hall aquaria. The string, about 22 inches long when gently extended (but still somewhat coiled) consists of 98 typical egg capsules. From these capsules about 40 to 50 young have emerged within the first two weeks in the aquarium.

Only one or two additional young specimens have been observed between December 1, 1961,

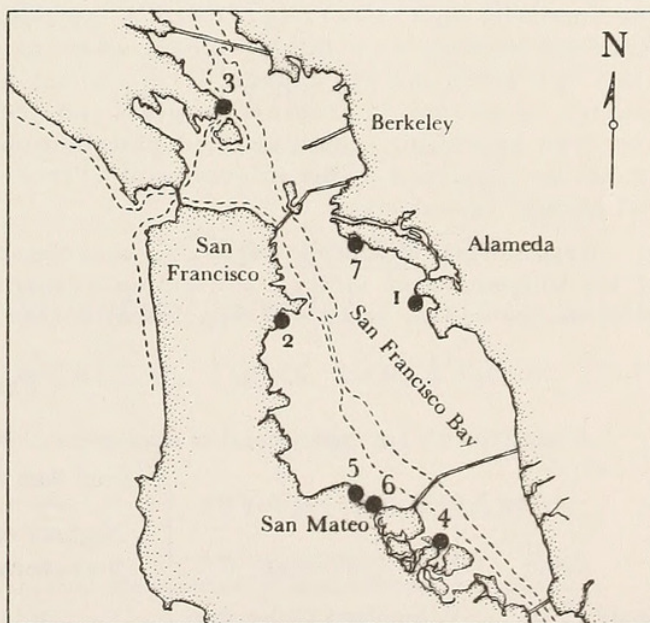


Figure 1

Map of the central and southern portions of San Francisco Bay, showing collecting stations of *Busycotypus (Busycotypus) canaliculatus* (LINNAEUS, 1758)

1: Bay Farm Island; 2: foot of Gilman Street, San Francisco; 3: Point Bluff; 4: Coyote Point; 5: Belmont Slough; 6: foot of San Mateo Bridge; 7: Alameda

(broken line is -28 foot contour)



and January 13, 1962.

Through the generosity and cooperation of Dr. Leo G. Hertlein, Dr. Myra Keen, Mrs. Martin, and Mrs. Cantrell, I have been able to measure a considerable sample of all specimens collected. In Table 1 I have summarized the results.

There are several interesting points to be observed from the map and the table. *Busycotypus canaliculatus* (Linnaeus, 1758) is reported from the east coast of the United States as occurring in shallow waters. Yet there are three distinct areas within San Francisco Bay where *Busycotypus* has been obtained, namely, the west shore and the east shore, respectively, of the southern portion of the Bay, and the west shore of the northern portion of the Bay. These three portions are separated from each other by relatively deep channels. The San Francisco Bay Pollution Investigation project under the direction of Mr. R. A. Wagner has carried out numerous dredgings in these channels, particularly in the southern portion, but no living or dead specimens of *Busycotypus* have been recovered (personal communication from Mr. Wagner). This poses a puzzle regarding the distribution of the species. Possibilities coming to mind are: separate introductions; accidental transport of egg strings or young specimens by logs floating across the Bay. Since the young are fairly large when they emerge from the egg capsule — i.e., about a quarter of an inch in greatest length — and are not free swimming, the disrupted distribution cannot be explained by the migration of a "free-swimming" larval stage.

Reports on *Busycotypus* from the east coast of the United States indicate a maximum length of  $7\frac{1}{2}$  inches. The largest specimen in Mrs.

Martin's collection, measuring 185 mm., just about equals this maximum length. It seems interesting to note the more or less gradual increase in the maximum length observed over the years.

It is apparent that *Busycotypus canaliculatus* is to be regarded as well established in San Francisco Bay, and if our amateur collectors do not eradicate the species by over-collecting, this may prove a welcome addition to the Bay fauna. There are no common native shallow water species which equal *Busycotypus* in size, except *Polinices lewisii* (Gould, 1847). Therefore, *Busycotypus* may be most welcome as dissection material for the many classes in elementary zoology taught around San Francisco Bay.

### Acknowledgment

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### Literature Cited

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1954. Catalogue and notes on the gastropod genus *Busycon*. *Proc. Biol. Soc. Wash.* 67: 115-150.

Table 1:

Measurements (in millimeters) of Specimens of *Busycotypus (Busycotypus) canaliculatus* (LINNAEUS, 1758) from San Francisco Bay

Date	Collection	Number of Specimens	Smallest	Largest	Locality (see Map)
1948 Feb.	Stanford University	1		96.6	Bay Farm Island
1950 Dec. 20	Cal. Acad. Sci.	3	64.4	102.0	San Francisco
1953 June 14	U. C. Zoology	1		36.8	Point Bluff
1954 Mar. 27	Cal. Acad. Sci.	4	105.1	161.8	Coyote Point
1958 June 29	U. C. Zoology	1		165.0	Belmont Slough
1958 Dec. 22	Cantrell	26	30.1	136.5	San Mateo Bridge
1960 May	U. C. Zoology	1		140.0	Alameda
1961	Martin	over 100	34.0	185.0	Alameda





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