

The Present Status of the Bay Clams of Oregon

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Introduction

A number of species of clams are present along the Oregon Coast. On the exposed outer coast the razor clam is the most important, followed by the rock-boring clams, or rock oysters; with others present to a lesser extent. In many areas however it is within the respective bays and river mouths where the important clam fisheries are concentrated. Some of these bay clams are also found on the outer coast but very seldom in any numbers. In the summer of 1947 the Fish Commission of Oregon began a study of these clams and areas to determine what measures would be required to permit the greatest possible utilization of this resource without endangering its existence for the future.

There are five important species of bay clams in the State with numerous others present as incidental forms. The important species are as follows:

Cardium corbis -- Normally called the cockle, or cockrel but occasionally referred to as quahaug.

Schizothaerus nuttallii -- Known as the Empire clam in the Coos Bay area or as the horse-neck, horse clam, blue-neck, or blue clam in other areas. Also at times referred to as mud clam.

Mya arenaria ----The soft-shell, Eastern, or mud clam. The term mud clam when used is usually referring to either this species, or one of the species of Macoma. Also at times called blue clam.

Saxidomus giganteus -- The butter clam, or quahaug as known in especially the Tillamook area. Also called Coney Island or New York clam, and at times rock clam.

Venerupis (Paphis) staminea -- Usually called the rock, or little-neck clam but frequently referred to as butter clam.

Table 1 gives the approximate comparative abundance of clams

for many of the Oregon Bays as far as has been determined at the present time. A blank space indicates the clam is not known to be present in any appreciable numbers in that area.

Table 1

Major Species of Clams Occurring in Certain Oregon Bays  
and Their Comparative Abundance

|           | Cockle        | Horse Clam     | Soft-Shell | Butter Clam | Little-Neck |
|-----------|---------------|----------------|------------|-------------|-------------|
| Nehalem   |               |                | XX         |             |             |
| Tillamook | XXX           | XXX            | XX         | X           | X           |
| Metarts   | XXX           | XXX            |            | XX          | X           |
| Nestucca  |               |                | XX         |             |             |
| Salmon    |               |                | X          |             |             |
| Siletz    | X             | X              |            |             |             |
| Yaquina   | XXX           | XXX            | XX         |             | X           |
| Alsea     | X             | X              | XX         |             |             |
| Umpqua    | <del>XX</del> | <del>XXX</del> | XXX        |             |             |
| Coos Bay  | XX            | XXX            | X          | X           | X           |

In general the available area is in direct relationship to the size of the respective bays since most of the tidelands are suitable for at least one of these clams. Cockles tend to predominate the more sandy areas, while the soft-shells are found in the higher mud areas with the greatest amount of fresh water. Horse clams are best suited to the intermediate sandy-mud flats. The butter clams and little-necks are also found here but are usually at their best in more gravel-like formations.

The Clam Fishery

The cockle and horse clam or Empire clam, are the only two being dug commercially at the present. Large quantities of cockles are dug for crab bait, this being the main bait used by both commercial and sports bay crabbers and also used to a limited extent by some of the outside pot fishermen. A minor amount is sold to

sportsmen for bay, jetty, and surf fishing. Considerable amounts are sold for human consumption. Fair numbers of horse clams are dug and sold for human use and soft-shells may at times be dug commercially when they can be obtained in large enough numbers. The majority of the cockles taken for crab bait (this being the only bay clam permitted to be used as such) are dug personally by the crab fishermen using them while the clams dug and sold for human consumption are sold by the commercial diggers in small lots directly to local restaurants, meat markets, etc. Due to the nature of this commercial digging and selling and the fact that the diggers have not been required to report their take according to species, it has been almost impossible to obtain any accurate figures on the total amounts taken.

A very large and active sports fishery exists on these bay clams. To obtain figures on the take of clams by both sports and commercial diggers and intensive census was run on the main tide flats of Yaquina Bay during the low tide series of July 14 through July 23, 1947. Counts (estimates made in some cases where necessary) on both number of diggers and take of clams for the main six days of the series gave the results shown in Table 2.

Table 2

Take of Clams in Yaquina Bay, July 17 - 23, 1947

← Calculations from Field Census

|                    | Total number of diggers<br>(man tides)* | Total Take in Pounds |           | Grand Total<br>in Pounds |
|--------------------|---|----------------------|-----------|--------------------------|
|                    |   | Horse Clam           | Cockles** |                          |
| Commercial         | 45                                      | 1,100                | 5,500     | 6,600                    |
| Non-Commercial     | 990                                     | 5,400                | 16,500    | 21,900                   |
| Total- All Diggers | 1,035                                   | 6,500                | 22,000    | 28,500                   |

\* - Equivalent number of diggers if all clams had been dug on one tide only.

\*\* - Includes an undetermined small number of little-neck and butter clams.

It is seen that the take of clams is considerable. Although on this tide series the sports take was three to five times that taken by commercial diggers

it is not believed that the yearly take for each group follows these proportions. This is due to the sports diggers being most active in the summer while the commercial take is comparatively consistent the year around. Digging is carried out on virtually every one of the twenty four tidal runs in the year but to a considerably lesser extent during the winter night tides and the lesser series of each month. However even when conservatively figured the take of clams in the Oregon bays may be considerable.

#### Apparent Trends in Populations

With the horse clam the effect of such intensity of digging is easily seen. In Tillamook Bay the most heavily dug area is that out from Bay Ocean due primarily to accessibility. Here the total numbers of clams present are strikingly less than in the other areas of the bay with the population that is present made up almost entirely of young clams which are removed about as fast as they enter into the fishery. In Yaquina Bay in the area of heaviest digging on the South side the horse clams are again very few in number and the more inaccessible, less dug area on the North side while still supporting a fair population is apparently on the decline. Length frequency determinations made at intervals since July 1947 show a decided reduction in size of clams present following the heaviest summer digging with as yet no sign of this size returning to its previous figure. The area along the east side of the lower portion of Coos Bay in the vicinity of Empire also has been dug out to a considerable extent. Here again the great bulk of the population consists of small, young clams. In all other areas visited where horse clams are found, the common complaint encountered is that the clams are less abundant than they used to be. Since isolated, little-dug areas in the larger bays have been found to support comparatively heavy populations of much larger, older clams this decline is attributed entirely to overdigging.

Evidence indicates the same trend occurring for the Eastern soft-shell clam. In the Nestucca, and in Salmon Bay for example where the grounds are easily reached the clams are very scarce. In the Nehalem where it is necessary to go by boat to reach the beds they are reportedly still numerous. However there may well be some other phenomenon, such as silting, also acting as a limiting factor on this clam since



some areas have been found in the Alsea and Yaquina which are known to be little dug but still have very small clam populations. Large numbers of dead shells are found indicating general suitability of the areas but likely periodic or occasional kills from outside causes.

It is not believed that there ever have been any great concentrations of butter clams (Saxidomus) but without question there are less now. For example at the present they are seldom found in the Yaquina, in only a few small spots in Tillamook, and in decreasing portions of Netarts. In the heavily dug portions of Coos Bay those found are again predominately small, young clams indicating a state of depletion existing in these portions.

The little-neck clam is sparsely though rather uniformly distributed in most areas suitable for its growth. It is seldom sought or dug specifically and its present state probably represents the minimum level of abundance to which it may drop and may possibly represent the normal conditions.

The cockle alone seems to show evidence of maintaining itself at a high level of abundance at the present. Although insufficient data is available to state that such is the case, there is at least nothing to show any striking or rapid decline.

#### Problems in Management

The first task facing the Fish Commission in the proper management of this fishery is an accurate survey of the present stocks in all areas. Considerable data has been gathered to date and it is expected that by the end of the summer (1948) this survey will be completed. The second problem is a matter of determining as closely as possible the take of clams in each area. The records of the commercial diggers turned in to the Commission are being analyzed and studies such as that here presented for the Yaquina, July, 1947 are being continued in that bay and have been started in the other main areas. This together with continuous surveys of the stocks will show any trends in abundance of the clams and the effect of digging.

To give maximum production it will not only be necessary to maintain proper take in numbers of clams but also to restrict this take to time or seasons when

when the clams yield the maximum in food value. In the case of the horse clam this is very important since it has been found that following spawning in February and March the clams yield only approximately one-half the useable meat they would normally due to their poor condition at that time. Accordingly considerable work has been, and is being done to determine exactly what times these clams should and should not be dug. Similar studies are being made for the other species. In the case of the hard shelled clams where regulation of such might be practical, the matter of appropriate size, or age, for harvesting of the clams is being investigated. It is also necessary to determine the age of the clams in order that the annual growth may be found since a slow growing clam such as the horse clam will of course require different management than a fast growing type such as the cockle appears to be.

A slightly different problem facing the Commission is that of the granting of oyster leases on State lands, which remove that much more clam land from public use. However within reason such leases do serve an important function by providing clam reserves which guarantee adequate spawning stocks for the bays. This is a problem requiring careful analysis to provide fair use distribution of the land to all parties, and one which the Commission is studying.

The resultant findings of these investigations will be used to base regulations of the fishery on, and as rapidly as each phase is completed will be published to inform the public of the reasons behind such regulations.

## Descriptions of Clams

To be inserted following respective listings of common names on first page.

Somewhere, probably at the start of this part, an appropriate reference should of course be made to the plates. Regarding these; all drawings except the third one of the Eastern which is a dorsal view of both shells, right valve above, left below; are of the left valve, exterior and interior views. They are natural size at the present so a 2 to 1 reduction which should make them right size for the final plates would be  $\frac{1}{2}$  natural size. I am neglecting to identify which drawings are which. This is probably a mistake, but if so I would suggest not using them. However hope they are acceptable.

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Cockle : " Identified by very prominent raised rounded ridges radiating from top center of shell, scalloped appearance at edge of shell. Length about 3 inches. "

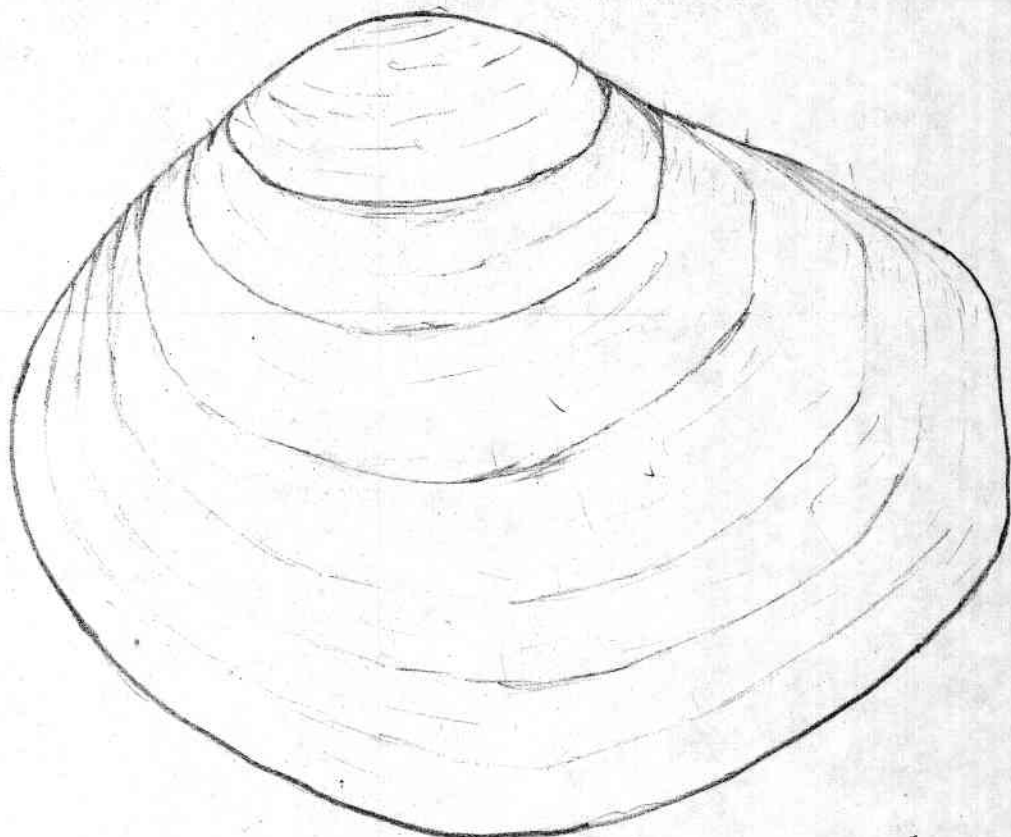
Horse clam : " Identified by large size with pronounced opening at end of shell from which extends a long neck which cannot be entirely drawn into shell. Shell covered with thin brown covering which tends to peel off. Length 4 to 6 inches. "

Eastern : " Identified by elongated shape, white chalky shell more or less covered towards the edges with a brown or black coating. Long neck which can be withdrawn into the shell. Length 3 to  $4\frac{1}{2}$  inches. "

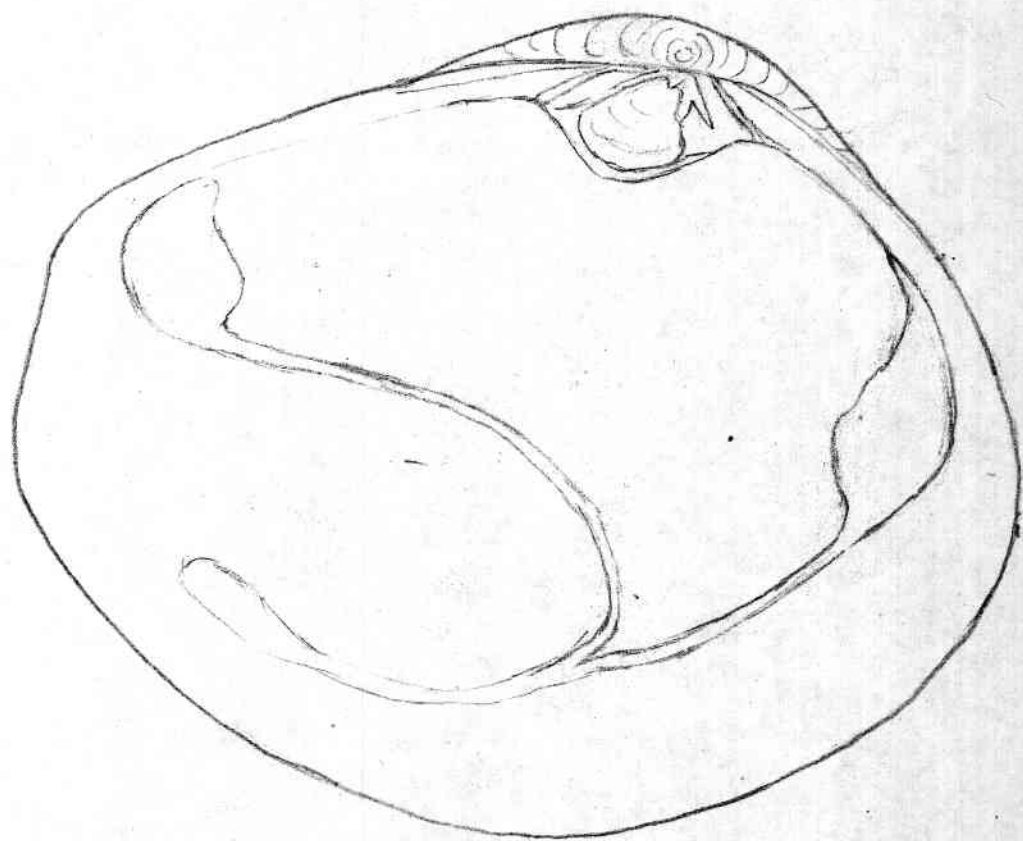
Butter : " Identified by thick hard shell with concentric lines parallel to the edge of the shell, no radiating lines. Length 3 to 5 inches. "

Little neck : " Identified by lines radiating from top center of shell as well as concentric lines, giving a criss-cross appearance to the shell. Length 2 to 3 inches. "

HORSE CLAM



EXTERIOR LEFT VALVE



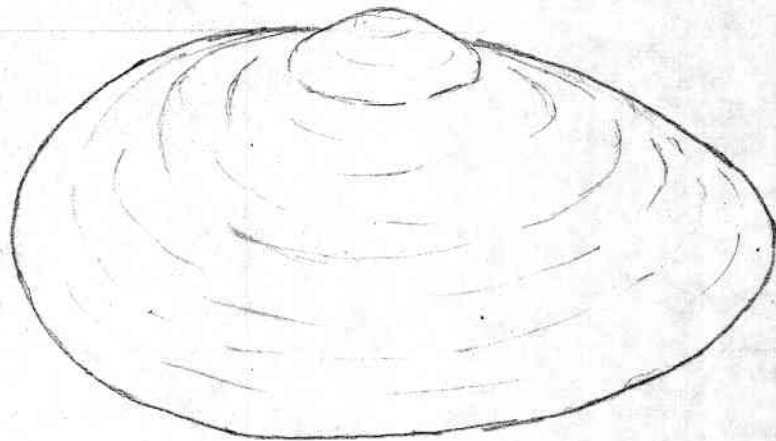
INTERIOR LEFT VALVE

7/27/48

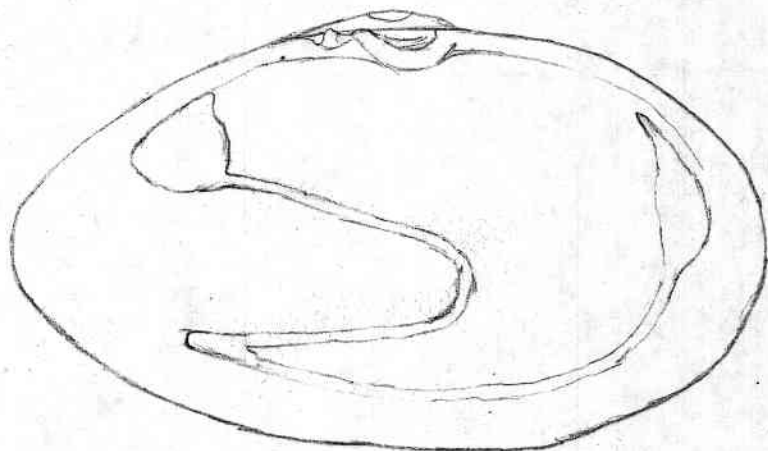
RJA



EASTERN



EXTERIOR LEFT VALVE



INTERIOR LEFT VALVE



ANTERIOR



POSTERIOR

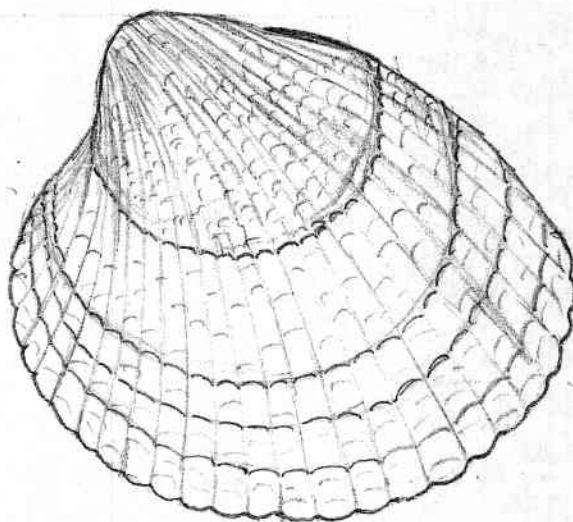
DORSAL VIEW  
BOTH VALVES

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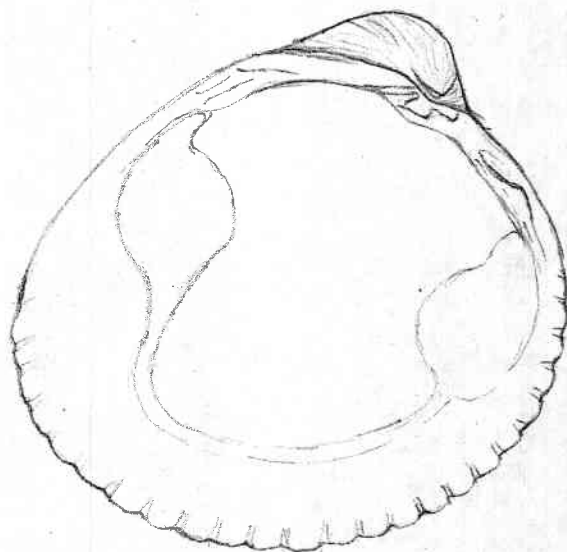
RJ.

COCKLE

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EXTERIOR LEFT VALVE

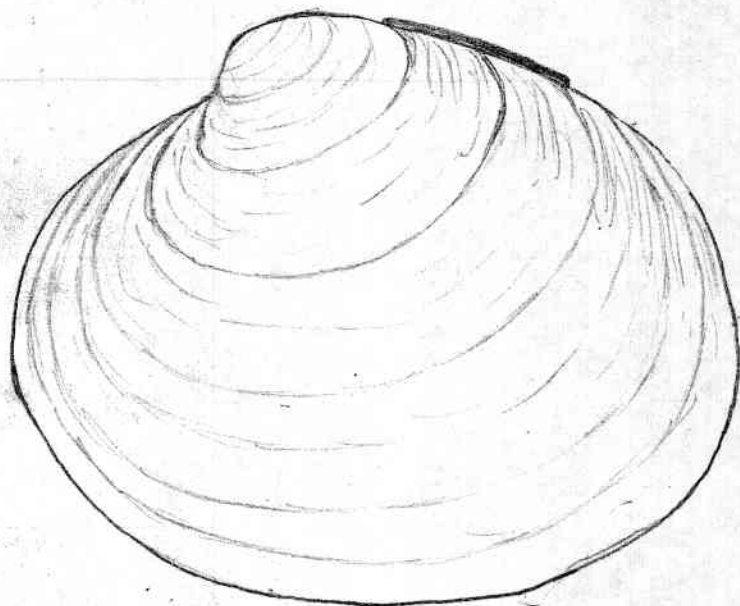


INTERIOR LEFT VALVE

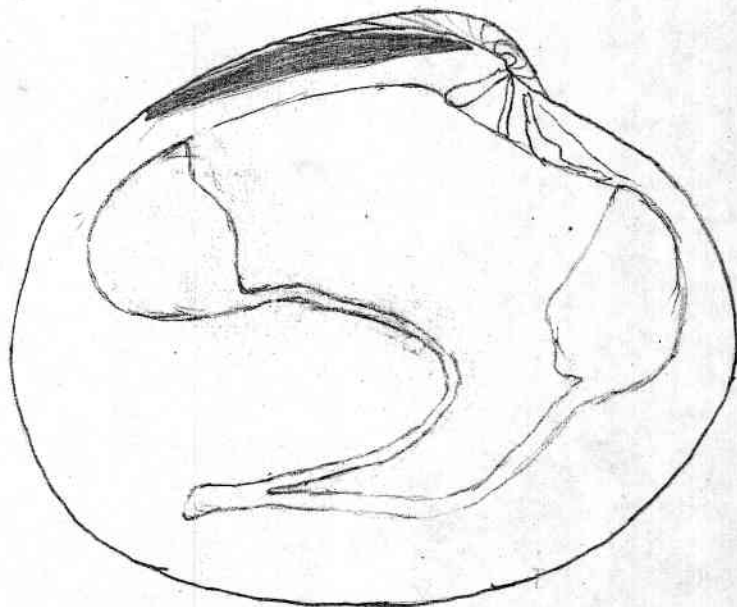
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R.T.

BUTTER CLAM



EXTERIOR LEFT VALVE



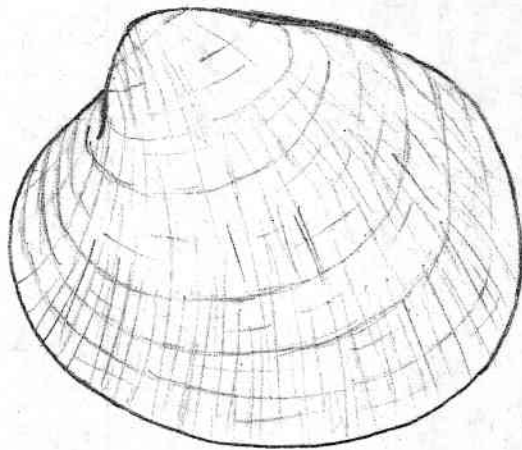
INTERIOR LEFT VALVE

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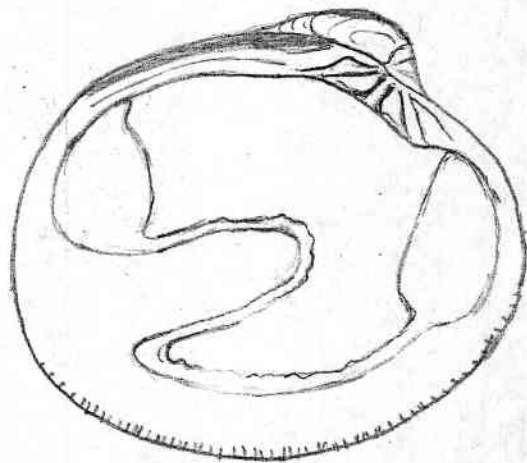
R.T.

# LITTLE NECK

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EXTERIOR LEFT VALVE



INTERIOR LEFT VALVE

JULY 27, 1948

RT



## Drag Boat Damage on Crabs

Considerable controversy exists between various fishing groups as to the damage done to crabs when brought up in drag gear. Accordingly observations were made on this while tagging crabs on the drag boat ~~XXXX~~ "Captain Ludvig" out of Astoria during December and January, 1947- 1948. Out of 588 crabs brought up in regular commercial operations from depths ranging from 20 to 80 fathoms which were ~~specifically examined~~ purposely examined for ~~any~~ injury, only 25, or 4.2% were found to be damaged in any manner considered to be serious enough to possibly cause the death of the crab. Further evidence of lack of damage is shown by the fact that ~~XXXX~~ tagged drag-caught crabs have been recovered to about the same proportionate extent as ~~XXXXXX~~ those tagged which were caught in regular commercial pots. The State of Washington also has considerable data which shows very little destruction of crabs when caught by the drag boats.

## Herring Spawning

A heavy spawning of Pacific herring occurred in many of the Oregon Bays the very last of February and first of March of 1948. In Yaquina Bay the peak came on February 28, and at wery near that same time in Tillamook Bay. Boat bottoms, piling, floats, etc. were coated with from one layer of eggs up to deposits of one-half inch in thickness. The tidal range for deposition of theeggs ranged from a plus 5 feet to ~~below low tide level~~ an undetermined minus 0 level. The eggs hatched in about a week depending upon the tide level, the higher ones hatching first. For some time following the larvae were consistantly found in plankton samples.