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## SHELL COLLECTING IN PUGET SOUND AND ALASKA.

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During the last summer it was my good fortune to take a most enjoyable trip to Seattle, Washington, where the Alaska-Yukon-Pacific Fair was in full swing; to the San Juan Islands in Puget Sound, where the Summer School of the University of Washington was in session; and on to Alaska, reaching a point as far west as Cook's Inlet. At all points possible I collected shells, and a full list of species and localities follows at the end of this article. It is a grateful task to acknowledge help in naming all doubtful species at the hands of Dr. W. H. Dall and Dr. Paul Bartsch of the National Museum, and the Rev. Geo. W. Taylor of Nanaimo, British Columbia. Without their help this article could only have been an account of the wanderings of a very amateurish conchologist.

The University of Washington, in connection with several other institutions which join forces with her, conducts a summer school on a group of islands in Puget Sound,—there are a hundred and fifty of them which constitute the county of San Juan in the State of Washington,—and here my wife and I dropped down on about fifty of the best people on earth, as biologists always are. This year they were trying the experiment of doing work in two places, and we arrived just in time to help them move camp from San Juan Island to Olga, on Orcas Island, thirteen miles away.

Orcas Island, the second largest of the group, supports a considerable farming population, but is much broken, and boasts a peak, Mt. Constitution, 2660 feet high, from which we had a glorious pano-

ramic view in all directions over thousands of square miles of water with scores of islands, and the mainland rising foothill above foothill to the Olympics and the Selkirks with their snowy ranges, and dominating and crowning all, the splendid peaks of Mt. Baker and Mt. Rainier.

We were soon established in camp quarters after our arrival, and regular work got under way. Here I met for the first time Dr Kellogg of Williams College, who was doing some most interesting work on the siphonal currents of the pelecypods. Others were doing equally interesting original work in various lines of botany and zoology, but of course the dredging was most important from my point of view. Their dredging was done by a regular shrimp dredger who was employed by the season. The apparatus is crude but very efficient. A trawl twelve feet wide was used, and as the water is shallow everywhere, the boat only carried about fifty fathoms of cable. No soundings were taken, but the depths, which generally varied between ten and thirty fathoms, were ascertained from the charts. I have done considerable work with the Alexander Agassiz, the boat of the Marine Biological Association of San Diego, and I spent five days aboard the Fish Commission Steamer Albatross off San Diego, but I have never seen such a wealth of material as we got at all stations. The great trawl always filled in a few minutes, but I was impressed by the fact that the variety of species was not nearly so great as in our more southern waters. As no one was specially interested in mollusks, I was allowed the privilege of taking any of the dredgings which I could handle. In fact we were royally treated by everybody at the station, and I shall always count the ten days we spent there as "the best yet."

A week later we were on our way to Alaska, that country of which some one has said, "If you are old, go by all means; but if you are young, wait. The scenery of Alaska is much grander than anything else of the kind in the world, and it is not well to dull one's capacity by seeing the finest first." As representatives of one of our local papers we were a part of the National Editorial Association, and as far as we went all Alaska was ours for the asking. The usual Alaska trip consists of a run from Seattle up to Skagway and back, the whole distance with the exception of a dozen miles or so being in land-locked channels, often only a few hundred yards wide, bounded by steep, heavily wooded mountains on either hand. Various towns of much

interest are visited, and a side trip up Taku Inlet shows the great Taku and Windom Glaciers. Formerly Glacier Bay was visited for a view of the Muir Glacier, but the immense amount of float ice and icebergs which have formed within the last two or three years make this visit unsafe and it has been abandoned.

On our trip we saw all that the regular tourist sees, and for full measure we ran west from Juneau into the open ocean, making a run of several hundred miles to Prince William Sound and Cook's Inlet. As we ran out of the still waters of Cross Sound into the open ocean early one morning on our right opened up the Fairweather range, one of the finest mountain ranges in all Alaska. One after another the great peaks came into view, until the whole range was off our starboard side. Many mountain ranges do not show their full extent, as to be seen the foothills must be crossed, and one's own elevation cuts down the apparent height. Here the range comes to the very ocean, and the overpowering sense of altitude is there. Four peaks rise above 10,000 feet, and Mt. Fairweather towers to 15,292 feet. From one point we could count six great glaciers, making their beginnings in the everlasting snows at the top and winding down like great rivers toward the sea.

At Cordova, on Prince William Sound, a place of 1200 people, which has grown in a year, we were taken inland fifty-three miles on the Copper River Railroad. This road, which is ultimately to reach a veritable mountain of copper, crosses several branches of the Copper River which are making the delta at its mouth, and then goes up the left bank until a point is reached where on each side, and within four miles of each other, a great glacier comes down to discharge its icebergs into the river. The face of each glacier rises sheer 350 to 400 feet, and each is over four miles wide along the river's bank. Opposite the lower, Child's Glacier, at a distance of 1500 or 2000 feet, we amused ourselves taking photographs, and repeatedly were successful in catching the great masses of ice as they broke away. In the face of this body of ice we actually suffered from the heat of the June day.

At Cordova I took advantage of a fine tide to do a couple of hours collecting, being rewarded by several good things, the best being a fine *Mactra (Spisula) alaskana* Dall. From Cordova we went to Valdez, the point of departure of the great dog teams for the Fairbanks region during the winter, but a very dull town in summer.

A year ago \$700,000 worth of gold was brought out on dog sledges. Unfortunately I was not able to do much collecting here, as it is almost imperative to take a small boat and get away from the waterfront of the town, and there was not sufficient time.

On the return trip we called at Ellamar, a very small mining town on a very small landlocked bay off Prince William Sound, where we had to run in on one high tide and wait for the next to take the ship out. I therefore had my work cut out for me, and, on account of the steady downpour of rain, I donned waterproof and rubber boots, and protected by an umbrella from the heaviest rain, I made the most varied and interesting catch of the Alaskan portion of my trip.

From Prince William Sound we sailed at midnight to Seward on Resurrection Bay. When I turned out in the early morning I found the tide well out and still going down, so I got busy at once. Here I found many things of interest, the best being *Trachydermon raymondi* Pilsbry, of which I succeeded in finding about a dozen. I finished my work well before the call to breakfast, and then we had a fine ride of twenty-five miles over the Alaska Central Railroad, which is now in the hands of a receiver, but was then being investigated by Mr. Geo. W. Perkins, of the firm of J. P. Morgan & Co., with a view to syndicating its completion. Since our return the papers have announced that this would be undertaken in the near future. The road already runs fifty miles into the interior through a region of marvelous beauty, and it has one unique feature of construction. At one point the engineers have blasted out a deep pass directly through a great glacier, which in future will have to be constantly cut away, as it encroaches on the railroad right of way.

From Seward we sailed down Resurrection Bay on a glorious afternoon, passing close to the rugged group of islands at the mouth, and looking back up the whole length of a great white glacier directly to the setting sun which was painting everything in matchless reds. Then the open ocean, and heavy clouds, and night settling rapidly, and cold winds driving us to our bunks for a much-needed rest.

Morning found us in Cook's Inlet, our most westerly point, and we sailed into the little station of Port Graham just at daylight. As we ran into the small bay where this station lies, we saw across the broad inlet the smoke of St. Augustine, the only volcano we saw which was even active enough to smoke. Aside from this slight

interest, it is a most beautiful mountain, a nearly regular cone rising almost from the water's edge for many thousand feet, and covered with glaring white snow from very near the base.

We spent the whole day at Port Graham, and the tide had run a long way out when we tied up. So it was overalls and rubber boots and a fine hunt of a couple of hours before breakfast. Then a hurried breakfast and three hours more of hunting. The collecting was good everywhere, so I could begin beneath the wharf and work either way. I found *Argobuccinum (Priene) oregonensis* Redfield, in quantity on the beach, and their numbers made me miss an important possibility. I had secured a considerable number of these shells in dredgings in Puget Sound, but the temptation to take more, which I suppose is the miserly instinct common to most collectors, induced me to throw a lot of them above the tide-line to be picked up later. When the tide had come up beyond the limits of profitable collecting I began to gather in this bunch of shells. Then I found among them four fine specimens of *Chrysodomus liratus* Martyn, which I had overlooked in my hurry, though they are so different that I cannot understand my blunder. It would have been more profitable to have hunted the beaches over for this last species, of which I have little doubt that I could have found as many as I could have cleaned for transportation.

At Port Graham I also found in quantity *Astarte rollandi* Bernardi. This fine shell I had not seen before, and I was glad to add it to my collection. The Indians were running around on the beach and in their bydarkas, and some of them watched me cleaning my catch. I have no doubt that my actions were a puzzle to them. None of them could be induced to talk any English, even if they knew any. However, by laying down ten cents and then tying an *Astarte*, then making use of a sign language invented for the occasion, I was able to interest a small native, and I finally kept him tying my bivalves for a couple of hours. With his help my day's work ran from 4 a. m. to 4 p. m., with very short intermissions for breakfast and lunch, so that on this day at least I felt very tired and very virtuous and slept the sleep of the just during the long night following.

Every hour of our 8000 miles of water travel was most enjoyable, as were the intervening stops, and from the point of view of a collector the trip was eminently profitable. I secured representatives

of 148 species, four of which, *Odostomia cookeana* Bartsch, *Alvania bakeri* Bartsch, *Onoba asser* Bartsch and *Leptogyra alaskana* Bartsch, are new. It is an unfortunate fact that of each of these new species except the *Leptogyra*, I secured only a single specimen, and of the *Leptogyra* I found only half a dozen.

*List of Shells Collected.*

In the following list the species marked Orcas Island were dredged near Orcas Island, Puget Sound, at depths varying from 10 to 30 fathoms. All other points mentioned are in Alaska except Ballard Beach, a point on the Sound just north of Seattle, Washington, and Sucia Island, a small island north of Orcas.

*Purpura foliata* Mart. (*Cerostoma foliatum* Mart.). Orcas Island, living and dead, rather common.

*Tritonalia lurida* Midd. (*Ocinebra lurida* Midd.). Orcas Island, dead, not common.

*Tritonalia subangulata* Stearns (*Ocinebra subangulata* Stearns = *Tritonalia michaeli* Ford. Orcas Island, a single young specimen, living.

*Boreotrophon multicostatus* Esch. Orcas Island, two living specimens.

*Boreotrophon orpheus* Gld. Orcas Island, two specimens.

*Boreotrophon tenuisculptus* Cpr. Orcas Island, 1 specimen; Port Graham, Alaska, 1 specimen.

*Thais* (*Nucella*) *decemcostata* Midd. (*Purpura decemcostata* Midd.). Orcas Island; Ballard Beach; Seward, Alaska.

*Thais* (*Nucella*) *lamellosa* Gmel. (*Purpura lamellosa* Gmel.). Common at all points visited.

*Thais* (*Nucella*) *lima* Mart. (*Purpura lima* Mart.). Ellamar; Seward; Port Graham.

*Thais* (*Nucella*) *saxicola* Val. (*Purpura saxicola* Val.). Ellamar.

*Thais* (*Nucella*) *saxicola emarginata* Desh. (*Purpura saxicola emarginata* Desh.). Ellamar.

*Thais* (*Nucella*) *saxicola ostrina* Gld. (*Purpura saxicola ostrina* Gld.). Sucia Island, Puget Sound.

*Argobuccinum* (*Priene*) *oregonense* Redf. (*Triton* [*Priene*] *oregonense* Redf.). Orcas Island; Port Graham.

*Chrysodomus liratus* Mart. Port Graham, 4 large specimens living.

*Chrysodomus tabulatus* Baird. Orcas Island, common, living and dead.

*Buccinum cyaneum* Brug. Ellamar.

*Alectrion* (*Tritia*) *mendica* Gld. (*Nassa mendica* Gld.). Orcas Island.

*Marginella* (*Volutella*) *pyriformis* Cpr. Orcas Island.

*Columbella* (*Nitidella*) *gouldi* Cpr. Orcas Island.

*Amphissa corrugata* Rve. Orcas Island, common.

*Bela fidicula* Gld. Orcas Island, 8 specimens living.

*Natica clausa* Brod. Orcas Island, Port Graham.

*Polinices* (*Euspira*) *lewisii* Gld. (*Lunatia lewisii* Gld.). Ballard Beach, common.

*Polinices pallidus* Brod. & Sby. Orcas Island, Ellamar.

*Velutina laevigata* Fleming. Orcas Island, not rare.

*Galerus fastigiatus* Gld. Orcas Island, very common on stones and other shells.

*Crepidula dorsata* Brod. Orcas Island.

*Crepidula grandis* Midd. Port Graham.

*Crepidula navicelloides* Nutt. Orcas Island.

*Trichotropis cancellata* Hds. Orcas Island, common.

*Tachyrynchus lacteola* Cpr. (*Mesalia lacteola* Cpr.). Dredged and on shore Orcas Island.

*Caecum hemphilli* Stearns. Ellamar.

*Eulima micans* Cpr. Orcas Island.

*Turbonilla* (*Pyrgolampros*) *alaskana* Dall. Orcas Island.

*Turbonilla* (*Pyrgolampros*) *taylori* D. & B. Ballard Beach.

(*To be continued.*)

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#### ON *OPEAS GOODALLI* MILLER.

BY H. A. PILSBRY.

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The species commonly called *Opeas goodalli* is the most slender and acuminate of the American *Opeas*. Its history has been given in detail in the Manual of Conchology, XVIII, pp. 200-203 (1906), but in common with other authors I overlooked the fact that the name was preoccupied. The species will henceforth be known as *Opeas pumilum* (Pfr.). The references may be found in full in the Manual, but the following synopsis of synonyms may be useful :