NOVEMBER 6.

The President, Dr. LEIDY, in the chair.

Forty-four persons present.

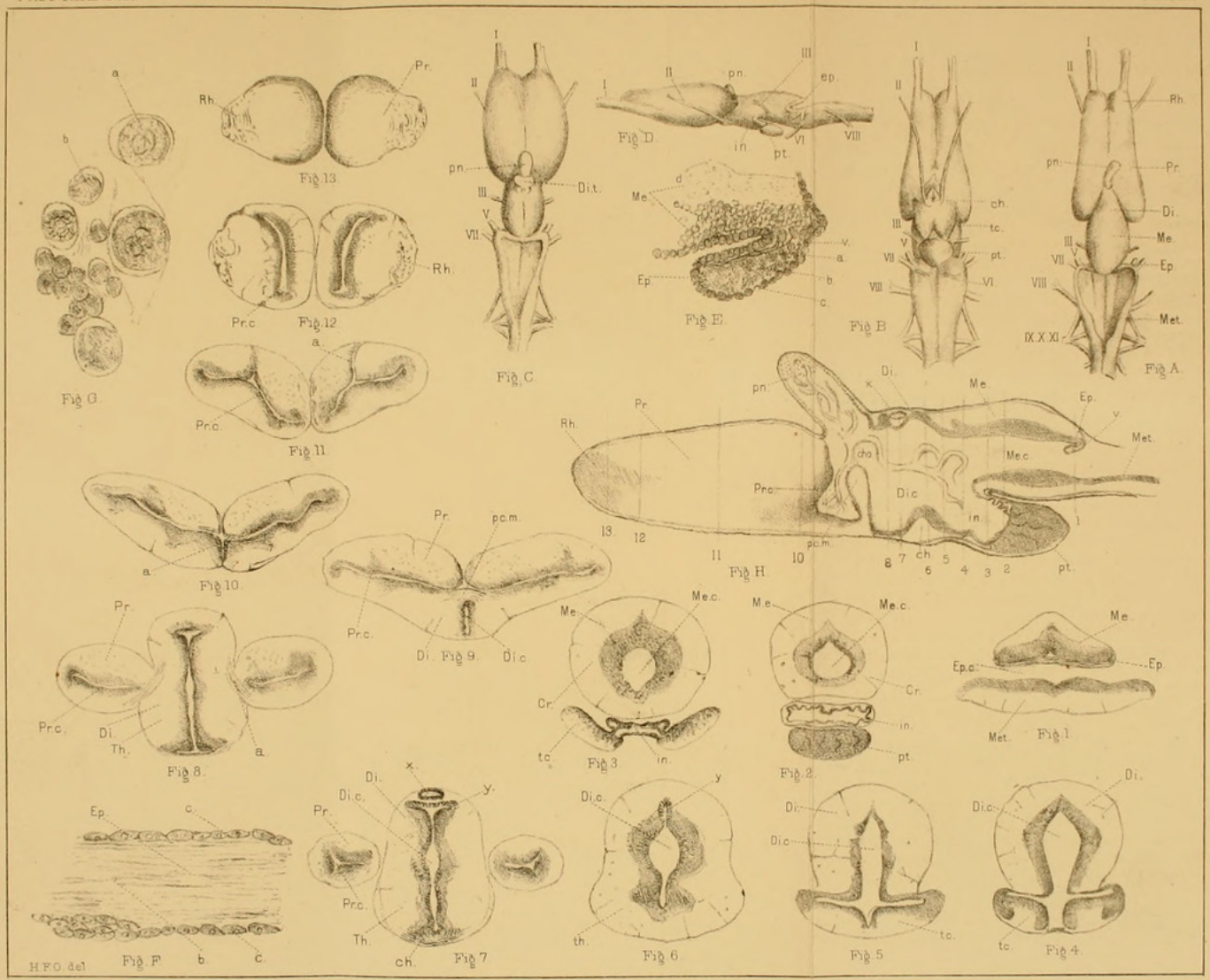
A paper, entitled "On the Value of the 'Nearctic' as one of the Primary Zoological Regions. Replies to Criticisms by Mr. Alfred Russel Wallace and Prof. Theodore Gill," by Professor Angelo Heilprin, was presented for publication.

On Visual Organs in Solen.—Dr. BENJAMIN SHARP called attention to a remarkably primitive form of visual organ that he had discovered in the siphon of *Solen ensis* and *S. vagina* (the common "razor-shell").

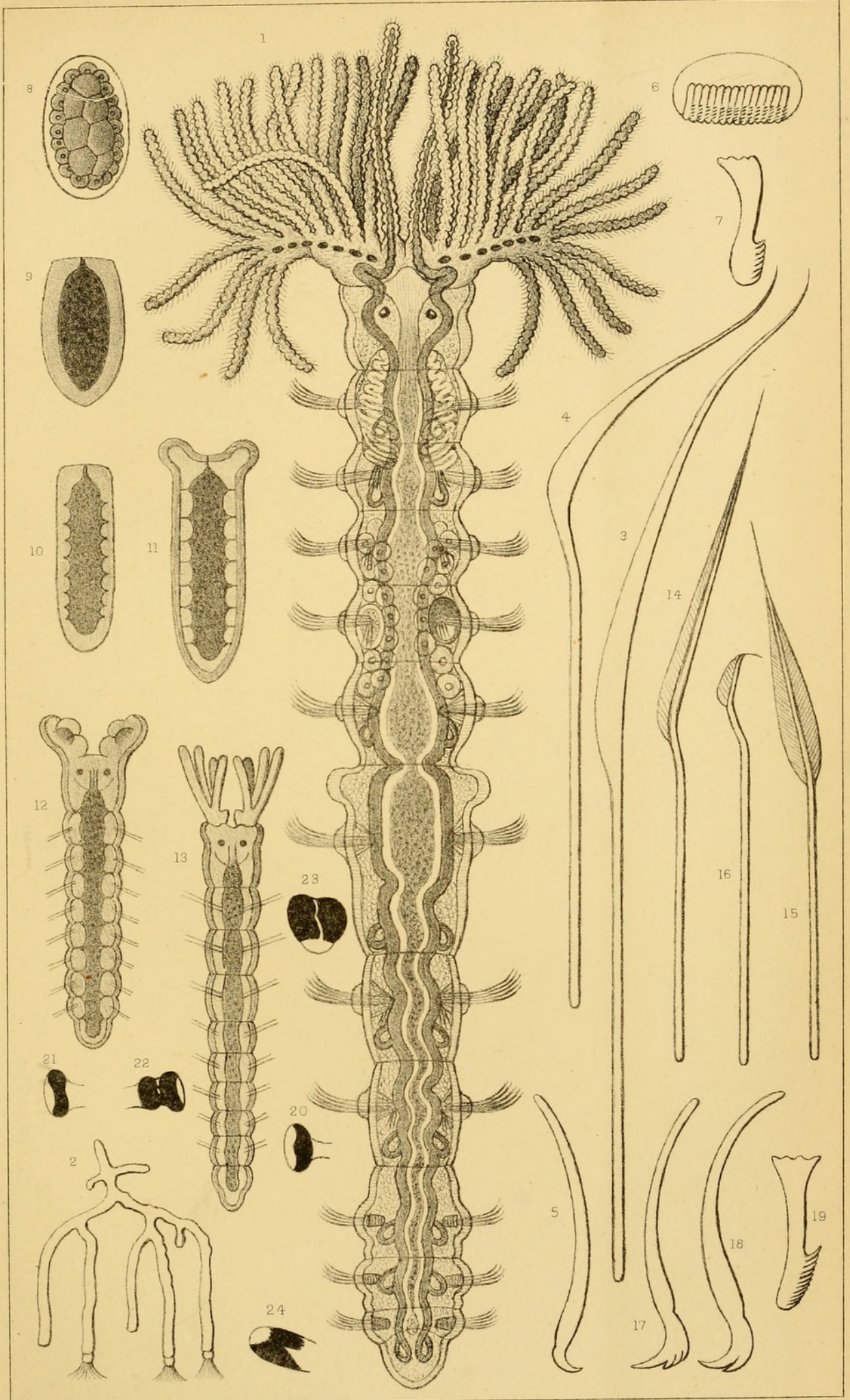
His attention was directed to the probable possession of visual organs by observing a number of these animals which were exposed in large basins for sale at Naples. A shadow cast by his hand caused the extended siphons of the specimens on which the shadow fell, instantly to retract, while those not in the shadow remained extended. Repeating this experiment at the Zoological Station at Naples, and being fully convinced that the retraction was due to the shadow and not to a slight jar which might have been the cause; he was led to examine the siphon more closely, and he also made a series of vertical sections for the purpose of very minute study.

When the siphon of a large *Solen* is cut open and examined, a number of fine blackish brown lines or fine grooves are seen. These are situated between and at the base of the short tentacular processes of the external edge of the siphon. As many as fifty of these little grooves were found to be present in some specimens, and some of them were from 1 to 1·5 mm. in length.

When a vertical section is examined these pigmented grooves are distinctly seen, and the cells of which they are composed are very different from the ordinary epithelial cells which cover the more pigmented parts. These latter cells are ordinary columnar epithelial cells with a large nucleus which is situated near the *tunica* on which it rests. The pigmented cells are from one-third to one-half longer than those just described, and consist of three distinct parts. The upper part, or that part farthest from the *tunica*, appears perfectly transparent and takes up about one-ninth or one-tenth of the total length of the cell; this part is not at all affected with the coloring matter which was used in coloring the whole. The second part of the cell is deeply pigmented and consequently opaque; it is filled with a dark brown or almost black granulated pigment; this takes up about one-half of the length of the cell. Below this is the third part of this cell, consisting of



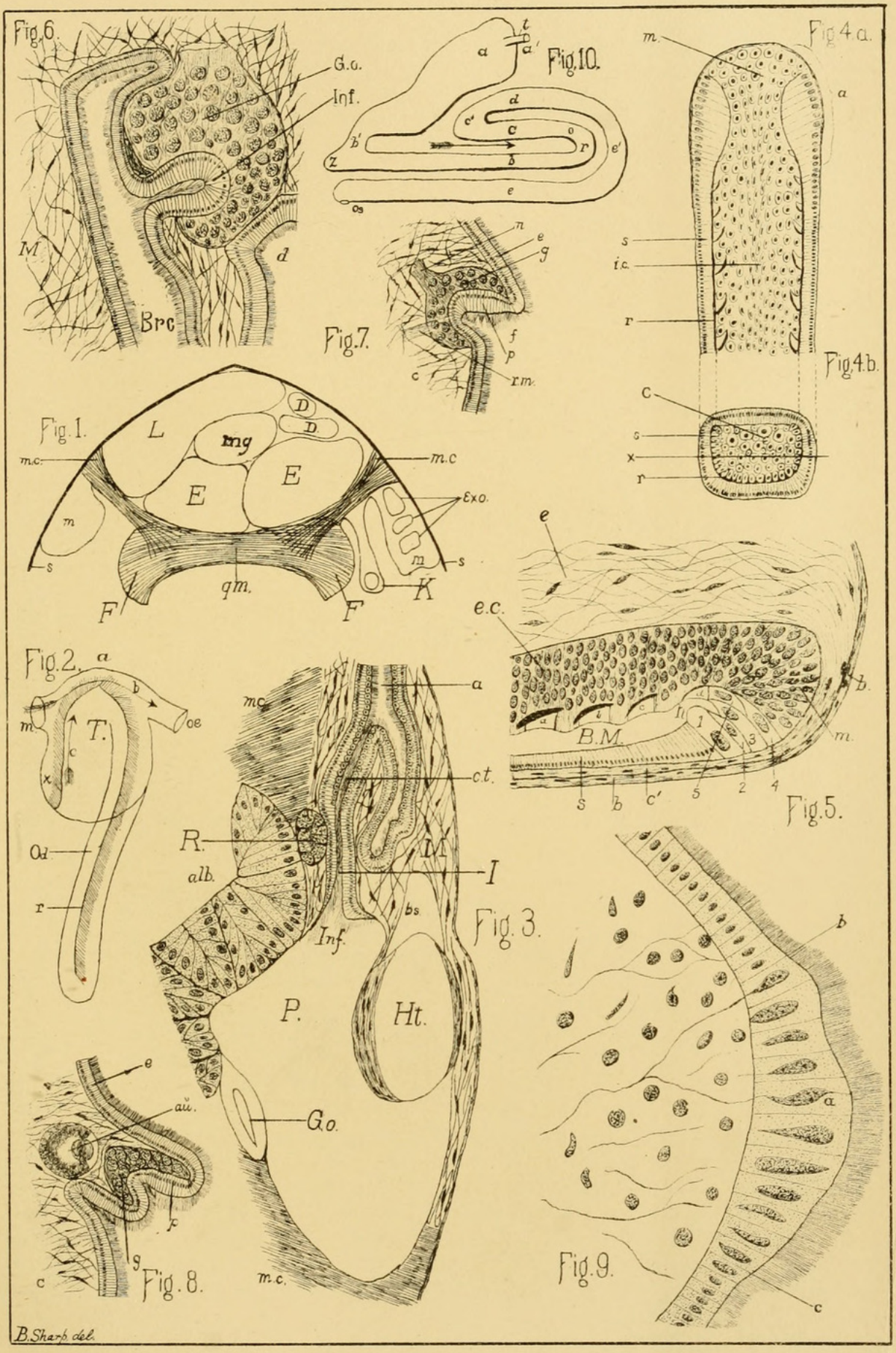
BRAIN OF AMPHIUMA.



Jos. Leidy M.D. del.

T. Sinclair & Son, Lith. Phila.

MANAYUNKIA SPECIOSA



SHARP ON ANCYLUS.

a clear mass, which takes a slight tinge when colored; this is probably the most active part of the cell; in this is imbedded the large oval nucleus. This nucleus is sharply demarcated and is filled with a granulated matter which takes a dark color in borax carmine, as do, indeed, the nuclei of all the epidermal cells.

These *retinal cells*, if they may be so called, are similar to those described by P. Fraisse in 1881 (Zeitschr. f. wiss. Zool., Bd. xxv), in the very primitive eye of *Patella cœrulea*, the principal difference being that in *Patella* the transparent part at the top of the cell seems to be a little more extensive. This eye of *Patella* is open, being merely an invaginated part of the epidermis, and has no lense. In *Haliotis tuberculata* we find an open eye also, but with the addition of a very primitive lense. The next higher grade of eye seems to be that of *Fissurella rosea*, in which the eye is closed and possesses also a lense; now in these two latter forms, where we find a lense present, the retinal cells do not possess the transparent ends as we find in *Patella* and *Solen*, but the pigment fills the upper part of the cell quite to the top. This would indicate, he thinks, that the transparent part took the place of a lense.

No special nerve-fibres could be detected passing to these pigmented grooves. Nerves passing to the eye of *Patella* were also wanting, while, on the other hand, distinct veins were found passing to the eye of *Haliotis* and *Fissurella*.

He further stated that this power of distinguishing a shadow would be of great use to the animal in the struggle for existence. The *Solen* lies buried perpendicularly in the sand and allows the siphon to project a little above the surface. This projecting part would, probably, frequently be bitten off by fishes, were it not for the fact that the shadow of the enemy would give warning, so that the siphon could be withdrawn in time to save it from destruction.

Notes on Glaciers in Alaska.—Mr. Thomas Meehan remarked that on his recent visit to Alaska he noted that the numerous icebergs coursing down Glacier Bay, always pursued their swift downward course towards the Pacific Ocean quite independently of the rising or falling of the tide. On reflection it was evident that this might be due to the greater density of the cold glacier water pressing on towards the lighter water in the Japan Sea, which set its force against the Alaskan shores. It was, indeed, incorrect to speak of a warm current flowing northwards in any active sense. Warm water never flowed or circulated because it was warm, but it flowed under the simple laws of gravitation—the heavier body pushing the lighter out of its place, and the lighter then being drawn backwards to the vacuum caused by the movement of the weightier volume. The flow of a warm current in the atmosphere or in the water must, therefore, be taken in a passive and not in an active sense; and it was, therefore, to the

immense ice-fields of Alaska themselves that we have to look for the singularly moderate climate of southeastern Alaska, rather than to the mere action of heated water alone. They furnish the heavy power which draws the warm current to its shores. With the disappearance of these huge glaciers, or the diversion of the immense volume of cold water to another channel, the cold of this portion of Alaska would probably be as intense as that experienced along its northern coast. The distinction was one of vast importance, and he ventured an opinion that much of the disappointment often experienced in Arctic navigation arose from overlooking it, and in regarding the warm current as the active agent in circulation.

In examining the Davidson, the Muir, and other glaciers, it also occurred to him that there were active agencies at work, overlooked by those who had made specialties of glacial study. Beneath the Muir glacier, which was said by various authorities to be about four hundred miles long, a large volume of water was flowing in a rapid torrent—this volume, on a carefully considered guess, being about one hundred feet wide with an average depth of four feet. According to information from a white man who had long lived with the Indians of this section, this subglacial river was flowing in about the same volume, summer and winter. The mouth of this glacier hung over into the sea, and formed icebergs in three different modes. Sometimes the edge of the glacier would, in its thinner sections, float over and be lifted off by the rise and fall of the tide; at other times huge masses would break off by their own weight; and at other times the upper edges, which, by the action of running surface water, would be worn into all sorts of rough forms, would topple over, rubbing their faces against the more solid ice, and making a sound which reverberated through the ranges of hills like peals of artillery, and which could be heard many miles away. There were thousands of smaller icebergs floating down Glacier Bay, the most of these evidently formed by the latter mode. It was not safe for the vessel on which he made the visit to approach nearer than a quarter of a mile to the face of this glacier, where it anchored for a day in order to make the examination; but it was near enough, especially with the aid of the ship's boats and good field-glasses, to make excellent observations. So far as could be ascertained through occasional deep fissures, no water came out from under the face of the glacier to the ocean. The mass of ice was apparently lying flat on a bed of rock, the ice occupying a width of something less than two miles, and estimated to be about 300 feet thick on an average of its whole width. This would, of course, obstruct the run of water directly to the ocean, and thus we had the lateral flow which diverged from the glacier's bed about four miles from its mouth. The Davidson glacier, in Pyramid Harbor, had retreated from the ocean, and by comparing facts observed in tracing a portion of its bed with what was seen in connection with this