In general, near the magnetic pole, the ship's compass is more or less worthless, its sluggish oscillations being easily overcome by the most insignificant local attraction, which it is almost impossible to avoid on shipboard. The farther removed from this great centre of magnetic force, necessarily the more reliance can be placed on the needle. The simple plan of rudely determining the points of the compass by a watch or chronometer regulated to mean time, conjoined with the motion of the sun in azimuth, will be sufficient in a land where the sun is shining throughout the day, and especially when the navigation depends rather on the bearings of the 'leads' and ice-barriers than any determinate direction. The fact that a vessel should follow a continuity of land, if possible, lessens the importance of the compass while capes and headlands can be kept in view.

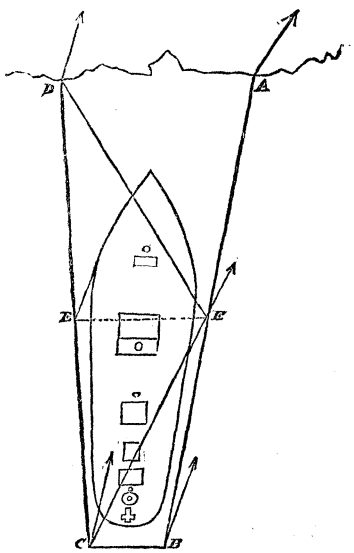

FIG. 10.

The 'ice-blink' is a well-known yellow glare that seems to hang over pack-ice. Any channels of natural sky seen through the glare indicate open water under them; and this is of use in approaching ice. In fact, the 'ice-blink' is more marked when at a distance from a pack in open water than when in one pack viewing another at the same distance.

Having explained ice-sawing, and hinted at a 'dock,' I will briefly describe an artificial one, and take as a typical example the case of the Alert, docked in the ice, Aug. 12, 1875, in Smith Sound. A plan of the dock is given in fig. 10. It was cut in about four hours, and could have been done, says the commander, in half the time, with a better organization and more experienced ice-cutting crew. It is a necessary operation to prevent being crushed between two bodies of ice, when the time will allow it, and also when a natural dock, formed of irregular blocks or floes, is liable to be obliterated by the increasing pressure eroding the fragile edges of the blocks. In this latter case a dock cut into the solid side of the largest block or floe would probably be a safe haven. The use of steam has rendered docks much less necessary than formerly, as the time occupied in cutting one will allow almost any steamer to escape any average danger.

Although, from this rather long list of probable arctic accidents to which a ship is exposed, escape would seem rare, yet, after all, it is wonderful to notice the small number of craft actually lost in this dangerous species of navigation, in proportion to the whole number engaged. Only those that are lost under tragic circumstances being brought before the public, they are generally supposed to be the greater majority of those thus employed.

FRED'K SCHWATKA,
Lieut. U. S. army.

BESTOWAL OF THE GRAND HONORARY WALKER PRIZE ON PROFESSOR JAMES HALL.

SOME years ago Dr. William J. Walker gave to the Boston society of natural history a prize-fund, from which, in accordance with the terms of the gift, annual awards are made to successful competitors who have written essays on assigned questions. But, besides these annual awards, a grand honorary prize was provided for, to be given every five years, and which the society was to grant, on recommendation of a special committee, "for such investigation or discovery as may seem to deserve it, provided such investigation or discovery shall have been made known or published in the United States at least one year previous to the time of award."

The society, in previous years, has awarded this honorary prize, amounting to five hundred or a thousand dollars, at the option of the society, to Mr. Alexander Agassiz and to Professor Joseph Leidy. This year the committee, after due consideration of the subject, has unanimously concluded to recommend for this prize, Professor James Hall of Albany; and the award of the highest sum was accordingly made by the society, at its meeting of May 7.

As the founder would appear to have contemplated some particular or integral 'investigation or discovery,' "we need not," says the committee, "take into account Professor Hall's numerous works or publications upon North-American geology and paleontology for the last forty years and more (comprised in about twenty-six volumes or parts of volumes, and in over two hundred articles or papers, reports, etc.), except as they relate to a special line of investigation, which Professor Hall early made his own, in which he has long been eminent, and which he may be said to have essentially completed, although a considerable portion of the results, which have been from

time to time 'made known' to the scientific world, are not yet published *in extenso*, with the illustrations prepared for the purpose.

"It is, then, specifically for Professor Hall's investigations in North-American paleontology, notably the paleontology of the state of New York and the regions adjacent, and of the earlier geological formations, that the committee suggests this award. In this field Professor Hall holds a position like that which has been so long occupied in Europe by Mr. Barrande. If his actual publications are as yet less extensive than those which have made the name of Barrande illustrious, this has not been from the lack of material, still less from lack of industry and scientific acumen on Professor Hall's part, but because he has not enjoyed the advantages of independent fortune and munificent patronage. Giving due credit to the state of New York for what it has done to further the publication of researches in its service, it still appears that his prolonged labors have been carried on under many discouragements and with insufficient means. It is understood, however, that deficiencies in this respect are about to be remedied: and it is hoped that this veteran paleontologist may have the satisfaction of superintending the full publication and proper illustration of his completed investigations.

PORTRAIT OF PROFESSOR JAMES HALL OF ALBANY.[1]

"In recognition of the great value of the scientific work to which Professor Hall's life has been so untiringly and successfully devoted, in encouragement of his closing labors, and in testimony of the society's high appreciation of these services to science, your committee would recommend that the maximum of the prize be awarded upon this occasion."

[1] From a crayon drawing, after a photograph taken for *Science*, April 17, 1884, by T. W. Smillie, photographer of the U. S. national museum.

THE CANTILEVER-BRIDGE AT NIAGARA FALLS.

The new bridge across the Niagara River, built to connect the Canada southern railway with the New-York central and Hudson-River railroad, and opened for traffic in the early part of the present year, has been widely noticed in the newspapers, and referred to as a marked advance in engineering. Quite a general interest in regard to it has therefore been aroused by the apparent novelty of the design, and the rapidity of construction. As the railway suspension-bridge is below, and within some three hundred feet of, the cantilever-bridge, the contrast between them is forced upon every observer. While the cost of the two bridges, aside from the approaches, was probably very nearly the same, the suspension-bridge required three years for its construction, and will carry one train and such load as may come upon the lower roadway; the cantilever-bridge was erected in seven months and a half from the beginning of the work, and is designed to carry a freight-train on each of its two tracks at the same time, each headed by two seventy-six ton engines, and crossing without slackening speed. The ability to accommodate a greater traffic, and the rapidity of construction, may justly be ascribed to the advances made in American types of iron bridges.

One of the first questions asked concerns the meaning of the term 'cantilever.' It signifies, as an architectural term, 'a bracket, or projecting member, to support a load, such as a cornice or balcony.' The illustration accompanying this article gives a very good view of the structure as a whole; and the action of the cantilevers, as well as the several members, can be understood from the following diagram.