the honeycombed ice remains intact and becomes nothing more than a collection of vertical ice needles ready to topple over at the slightest touch. Outwardly this sheet of instability appears firm and compact. During the period of rotting the temperature of maximum density is slowly advancing upwards towards the ice sheet. Below the surface of maximum density convection of heat brings more and more warm water up from the bottom. There must be then a definite surface in the water at 4° C., below which the temperature is kept fairly uniform by convection and above which there is no movement in the water to disturb the existing temperature gradient up to the ice sheet. As soon as the 4° surface reaches the under side of the already honeycombed ice the change of temperature and movement of water must be fairly sudden, causing a rapid collapse of the whole structure. This no doubt accounts for the characteristic rattling noise when the phenomenon takes place. The ice needles soon melt in the warm water, which gives rise to the general belief that the ice sinks.

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McGILL UNIVERSITY,
April 16, 1910

PLANKTON

THE article of Professor Chas. E. Woodruff in SCIENCE of April 22 recalled to me observations I had made of phosphorescence of the sea. In connection with astronomic work I have sailed many seas, and have circumnavigated the globe in completing its astronomical girdle in longitude.

In the waters along southeastern Alaska, an area of fog, rain and little sunshine, I had observed most exquisite phosphorescence of the sea. When being rowed from the government steamer ashore, every dip of the oars showed them surrounded by that delicate bluish light of phosphorescence. When I walked over the beach of the receded tide every footprint was a blaze of this same light.

Some years subsequently when I started on my work round the world I looked forward with pleasure to beholding the grand phosphorescence of the tropics, under the belief that in the warmer waters and bright sunshine, the plankton—the cause of the phosphorescence—would be more densely distributed. In this however I was sadly disappointed.

In none of the tropical seas did I see any phosphorescence that could at all compare with what I described above. In vain have I stood at night at the bow or side of the steamer on a smooth sea watching for a fine display of phosphorescence. Now and then the comb of the small wave as the vessel parted the waters showed a fringe of the bluish light, and nothing more.

Arrhenius in his "Lehrbuch der Kosmischen Physik," p. 376, says that the phosphorescence of the sea "is most beautifully developed in the tropics," which is not my experience. Major Woodruff's explanation and application to the tropics of the destructive and lethal effect of light on the plankton agrees very well with my observations on the phosphorescence of the sea in different parts of the world.

OTTO KLOTZ

OBSERVATORY, OTTAWA,
April 28, 1910

ATHANASIUS KIRCHER AND THE GERM THEORY OF DISEASE

IN reference to Dr. Riley's note in SCIENCE for April 29, I am glad to make a prompt *amende honorable* for a hasty error of commission in regard to the magnifying power of Leeuwenhoek's microscopes, but it is difficult to see how any injustice has been done to Athanasius Kircher thereby, since the quality of his magnifying glass seems principally a matter of conjecture. If we accept Osler's adjustment of the matter of priority in the bacterial theory of infectious diseases, then the medical fame of the remarkable priest who was also a mathematician, physicist, optician, pathologist, Orientalist, musician and virtuoso, rests rather upon his seven experiments upon the nature of putrefaction[1] than upon his

[1] "Kircher Scrutinium," Romæ, 1658, caput VII., pp. 42–49.