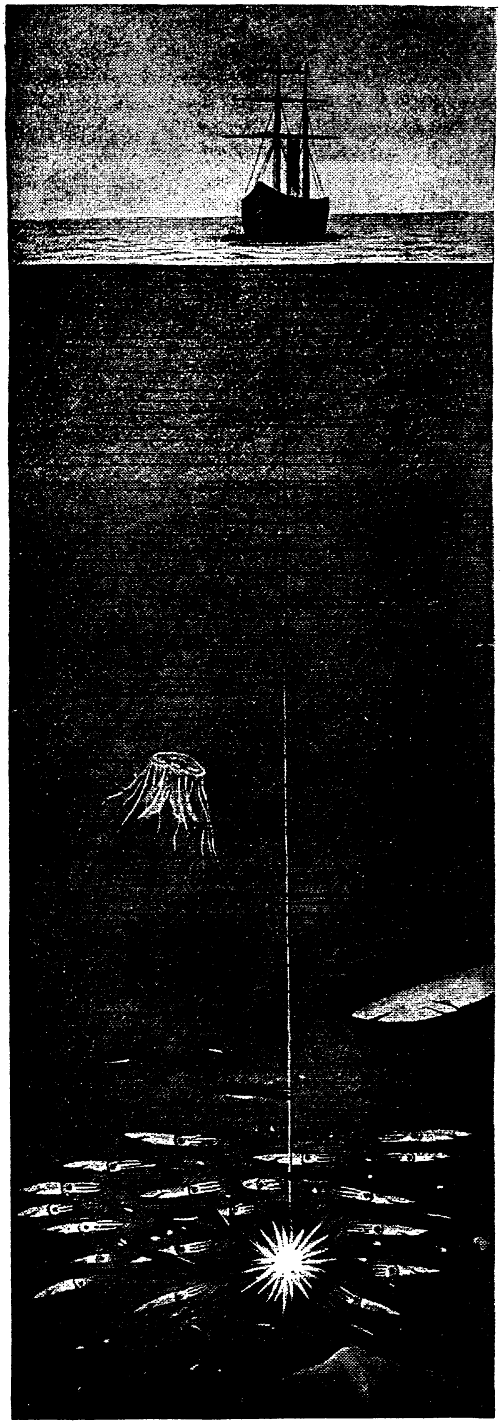


FISH-COMMISSION STEAMER ALBATROSS.
A SUBMERGED ELECTRIC LIGHT TO ATTRACT FISH, AND ILLUMINATE THE WATER.

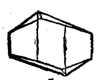
this had cooled, it was wrapped with insulation-tape, and served tightly with twine. This was again covered with gulloot, then tape, and finally with melted gutta-percha; and, when the gutta-percha had cooled, its entire surface was seared over with a hot iron to make sure of filling any cracks or holes it might contain. The lamp was then lowered into the sea, about seven hundred and fifty feet of cable being paid out, without any indication of failure. To ascertain if the lamp was lighted at all times, we substituted a lamp for the cut-out plug in the deep-sea circuit. This brought both lamps in the same circuit, which caused them to glow at about a cherry-red instead of a white light; and had any accident happened to break the lamp in the water, or to cause a leak, our upper lamp would have immediately sprung into incandescent whiteness. G. W. BAIRD,

Passed assistant engineer, U.S.N.

CRYSTALS IN THE BARK OF TREES.

IN examining the interior of certain insects and myriapods living in and feeding on the wood and liber of decaying trees, the writer has often had his attention attracted by many beautiful and well-defined crystals mingled with the food-contents of the intestinal canal. The crystals appear to be insoluble in the intestinal juices, as they pass through the entire tract unchanged. Recently, in examining a large lamellicorn larva obtained from beneath the bark of a decaying white oak, I again observed an abundance of the same kind of crystals; and shortly after, numerous others were found in a Polydesmus taken from beneath the bark of a hickory log. Feeling sufficient interest in the matter to learn the source of the crystals, I examined a large white oak, dead and decaying, but still standing, with the bark loosely attached. On the inner side of the bark was a thick, yellowish-white, pulverulent layer, — the decayed liber. This readily crumbled to powder; and a small portion, diffused in water and submitted to the microscope, exhibited a multitude of crystals, forming the greater proportion of the powder, and of the kind previously noticed in insects. The crystals appeared perfectly fresh, and not changed by the surrounding decay, but were isolated, sharply defined, and highly lustrous. They measured from about the two-thousandth to the six-hundredth of an inch. Two forms were common, — simple, as represented in fig. 1; and twinned, as in fig. 2. A portion of the powder was submitted to my friend, Prof. F. A. Genth, for analysis, without informing him as to its source. The report was, "It seems to be mostly calcium oxalate, with some carbonate and organic matter." The crystals pertain to the monoclinic system, like the mineral whewellite. In another decayed white oak examined, the pulverulent liber, of darker appearance than in the former, consisted of crystals, cellular *débris*, with no bast-fibres, but with numerous long, dark-brown, many-celled sporidia of a fungus, and a few dead rotifers. Under similar circumstances, the same kind of crystals, equally abundant, were observed in a dead chestnut-tree.

The liber of the fresh or undecayed white oak and chestnut exhibits the calcium-oxalate crystals arranged in close longitudinal rows, as represented in fig. 3, situated among the bast-fibres, and nearly as abundant. The crystals are smaller, approaching the ends of the series; and the spaces occupied by the latter taper at the extremities. Each crystal occupies a separate cuboidal cell, or at least a distinct compartment of a long fusiform space, bounded by the bast-cells. In the rows of crystals of the white oak, from twenty-five to thirty-five were counted, occupying a space of about the fiftieth of an inch in length. In the chestnut liber, from twenty-five to forty-five crystals were counted in different rows. In the liber of the butternut the crystals are compounded in spheroidal clusters, and form rows arranged in the same manner as in the preceding trees.



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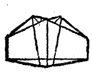

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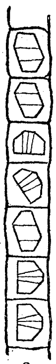

3

FIG. 1. — Calcium-oxalate crystal.
FIG. 2. — Twin form of the same. Both from decayed liber of the white oak, magnified 250 diameters.
FIG. 3. — Portion of a series of crystals from fresh liber, magnified 300 diameters.

Without having had any intention of investigating the occurrence of crystals in plants, I have been led to make the present communication on what, to botanists, may be a familiar fact, under the impression that many, like myself, have heretofore been ignorant of it; and this for the reason that sufficient notice of the matter has not been given. Our ordinary manuals, while referring to the occurrence of crystals in plants, and giving a few illustrations of those observed in herbaceous plants, take almost no notice of the beautiful forms in the inner bark of our forest-trees. The 'Micrographic dictionary' mentions the occurrence of raphides in the bark and pith of many woody plants, as the lime and vine, but makes no reference to, nor gives illustrations of, such as occur in oaks, the chestnut, the hickory, etc. No more beautiful example of plant-crystals can be so readily obtained than that exhibited in thin slips of the liber of the oak or chestnut.

Although the occurrence of crystals in vegetable tissues was observed and described by Payen in 1841 (*Comptes rendus de l'académie des sciences*), the first and fullest account of the crystals of the liber of forest and fruit trees was given by Prof. J. W. Bailey, in a communication to the American association of geologists and naturalists, in 1843, afterwards published, with a plate, in the *American journal of science* for 1845, p. 17. Sanio subsequently described the same crystals in the *Monatsberichte* of the Prussian academy of sciences for 1857.

JOSEPH LEIDY.

THE PHYSIOLOGICAL STATION OF PARIS.[1]—II.

THE black screen shown in fig. 4 is a kind of shed, three metres in depth, fifteen long, and four high. This height is necessary in photographing birds on the wing; for, on rising, they immediately leave the dark field. When the walk of a man or an animal is being studied, the opening of the screen is limited by a frame covered with black cloth suspended from its upper part: this regulates the ingress of light under the shed, and makes its cavity darker. In addition, a long strip of velvet two metres and a half broad fills all the lower part of this cavity. Thus the light coming through the bottom of the screen is almost entirely cut off.

In fig. 4 a man dressed entirely in white is walking before the dark screen. The course on which he walks is slightly inclined, in such a way that a visual ray, proceeding from the objective, passes very near the surface of the ground without meeting it anywhere. This is necessary in order that in the picture the feet of the walker may be entirely visible, while the ground is not: otherwise the light reflected from the ground would make an impression on the sensitive plate at the very points where the images of the feet should be produced, and make them obscure. The course is raised about twenty centimetres above the surrounding ground; and along the full length of this relief there runs a plank on which alternate divisions, each a metre and a half long, are painted black and white. The plank thus divided is seen in the photographs, and is useful in measuring the distance run between two successive images, and in estimating the size of the subject, the amplitude of his reactions, and the extent of displacement of each part of his body. In order to know the rapidity of movement, the time consumed in traversing the various spaces must be measured. Now, if the machinery which

[1] Concluded from No. 42.