

Are Eyes ever Autophanous?

I VENTURE to suggest the following simple explanation of the phenomenon described by Colonel Herschel in *NATURE* of January 18. At the distance at which his experiments were made the light from the lantern or other source enters the lens practically as a pencil of parallel rays, which is concentrated as a bright spot on the retina. The divergent light from this bright spot, which passes backwards through the lens, is again made into an almost parallel pencil. If the retina is exactly in the focal plane of the source of light, and the image an absolutely sharp one, the whole of the light is again concentrated on to the bull's-eye of the lantern, and without the use of a transparent, but partially reflecting, surface, it must be impossible to see it. But the least blurring of the image, from whatever cause, leads to a slightly divergent pencil, which, however, is still narrow enough to concentrate the returning light within a degree or so from the direction of the original source. To an observer within this cone of rays the bright spot on the retina will appear to fill a part or the whole of the pupil, just as a black dot may be made to fill the whole aperture of a lens to an observer at a distance by holding the lens at its focal distance from the point in question.

A cat's eyes when in shadow may often be seen by a watcher, himself in the light, to be filled with a faint luminescence, which disappears when the watcher's own eyes are shaded. The source in this case must be the bright surface of the face of the observer, possibly combined with the reflected point or points of light on the *external* surface of the observer's eyeball. The phenomenon is rather a curious one, and may account for a certain number of the cases in which an animal's eyes are supposed to be autophanous.

E. M. ANDERSON.

Edinburgh, January 27.

Chalk and Ice.

Two nights of hard black frost, following upon the recent wet weather, has resulted in pieces of chalk resting upon a wet clay soil becoming curiously coated with ice. This occurs only in the case of chalk, other stones—except fragments of brick, which have a thin veneer of ice on them—and lumps of clay being free from it.

A piece of chalk 2 in. × 2 in. × 1 in. embedded in the soil is covered with ice as in Fig. 1. The ice is fibrous. Small pieces of chalk give forms as in Fig. 2. The central figure evidently illustrates two nights' growth, the upper

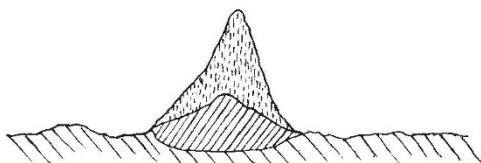


Fig. 1.

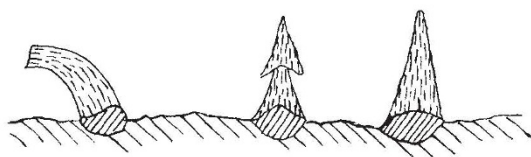


Fig. 2.

cone having been thrust off the chalk by the growth of the one below.

The moisture has evidently frozen on the chalk, fresh moisture rising from the ground and passing through the chalk, thus keeping up the supply. The chalk itself is not frozen, and can be broken easily by hand, but the pillar of fibrous ice is firmly frozen to it.

We also noticed tooth-like pieces of ice projecting from the lawn, and in every case these were found to rest on pieces of chalk beneath the surface. An examination of the flower beds revealed bosses of ice coming up through the soil, the ice in all cases resting on lumps of chalk

beneath the surface. The rising water in the chalk tends to prevent the latter freezing, the cold spending itself in producing the ice resting upon the chalk.

It is conceivable that a stratum of stones and clay, resting upon chalk, might in a severe climate become separated from the chalk by an ice layer. The formation of ice below the surface in this way may account for the "soil creep" which has occurred in the past, and the effects of which are now so noticeable in chalk districts.

R. M. DEELEY.

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Glazed Frost.

THE deposit of "glazed frost" sometimes attains remarkable thickness in Newfoundland, and the great weight of ice formed causes considerable flexure of even thick branches of trees.

I have seen every twig and every blade of grass duplicated on the windward side in clear ice, the ice "twig" often having a diameter two, three, or even more times that of the twig on which it was formed.

Thick slabs of ice appear on the windward sides of tree trunks, palings, and even of walls. In Newfoundland the rain is often followed by bright sunshine, when the effect is most beautiful, and is aptly described in the local name "silver thaw." The explanation of the phenomenon, quoted from "The Observers' Handbook" in Mr. Harding's letter to *NATURE* of January 25, would seem to be justified by the thickness of the deposit formed on twigs and on blades of grass; it would be difficult to account for a thick deposit of ice if the raindrops were not supercooled before touching the trees or ground.

E. R. MARLE.

Hartley University College, Southampton,
January 29.

The Thawing of Frozen Water Pipes.

As the present frost is causing serious inconvenience in many houses, I should like to direct attention to a method of thawing ice in pipes which I have frequently put into practice and found effective. It is based on the principle that strong brine eats its way into the ice like an acid, and that the resulting diluted brine rises and makes room for the denser fluid. Close the main tap, and with a spanner unscrew the top of the valve of the frozen water-pipe and remove the small valve. Ball taps to cisterns may have to be unscrewed altogether. Insert a few feet of one-eighth inch rubber or lead tubing into the pipe, and pour concentrated brine into it through a small funnel. Replace the valve and cover, but leave the valve open; also open the main valve, and wait. If the ice plug in the pipe is only 1 or 2 feet long it will have been eaten through in about an hour's time; if longer, the above operation should be repeated several times. The brine is prepared by boiling an excess of salt in water, say half a pound per pint; it should, if possible, be used hot, and renewed frequently.

West Didsbury, February 5.

C. E. STROMEYER.

The Names of Fossil Plants.

EVERY botanist must agree with Dr. Marie Stopes that there should be some ready way to distinguish between the fossil plants which are referred with reasonable assurance to their genera, and those which are merely placed in genera which they seem to resemble, but to which they very probably do not belong. We must also agree that it is unsatisfactory to call every doubtful leaf "Phyllites," without any serious attempt to indicate its affinities. The use of Gothic type, suggested by Dr. Stopes for the doubtful genera, has some disadvantages, one of them being the inconvenience to the printer. Would it not be simpler to use quotation marks, in the case cited by Dr. Stopes writing "*Ophioglossum* *granulatum*?" The generic name only should be enclosed within commas, as it alone is supposed to be in doubt. The method proposed has the advantage of being already more or less current, and readily understood by any reader.

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