lary ſtructure, not only of ſome of the corals and corallines, but of the keratophytons, or ſea feather; only with this difference, that the tubes of the herring-bone coralline are of a ſpongy elaſtic nature, and always remain open; whereas the others, being of a more ſoft and viſcid nature, by time, and the heat of the climate, are compreſſed together, and harden, ſome into ſtone, and ſome into horn or wood: But this I may explain, perhaps, more clearly hereafter.

In *Plate* XVII. you have, at *E*, the natural ſize and appearance of the herring-bone coralline; at *F* and *G* the root, and one of the upper branches, are magnified, to ſhew the tubes.

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## LXV. *Obſervations on the late ſevere cold Weather.* *By* William Arderon, *F. R. S.* *and* Henry Miles, *D. D. F. R. S.*

*Part of a Letter from* William Arderon, *F. R. S.* *to* Henry Baker, *F. R. S.* *containing Obſervations, made at* Norwich, *on the late ſevere cold Weather.*

*Dear Sir,*

Read Feb. 11, 1754. I Have not time to ſend you now a diſtinct account of all the obſervations I have been making this ſevere ſeaſon; but the few that follow will, I hope, excuſe me to you, for the preſent. They were taken by thermometers expoſed to

the open air, in my garden, which varied ſometimes 40 or 50 degrees in 24 hours; the cold coming, as it were, by fits, in a ſurpriſing and unuſual manner.

December 30, at 11 o'clock at night.—All the ſpirits in Haukſbee's thermometer retired into the ball, and Farenheit's ſtood at 20 degrees: At this time I let down a Farenheit's thermometer into the river, to the depth of 4 feet, during 12 minutes; and, when taken up, it ſtood at 33 degrees.

This ſame evening I expoſed an open glaſs jar full of water, in my garden, to be frozen; and in the morning it was all ſolid ice, riſing in the middle, in figure like the fruſtum of a cone. I expoſed alſo, in the ſame place, an open glaſs of ale, which froze even to the bottom, in a very odd manner; for the watry or weaker parts were frozen into plates of ice, ſticking one to another by their edges, the more ſpirituous parts remaining between them, in their interſtices, unfrozen; which being drained off into another glaſs, the taſte was almoſt as ſtrong as brandy, with an high flavour of the hop.

The rhine, or hoar-froſt, now obſerved on horizontal planes, was compoſed of curious thin figured plates, ſtanding perpendicular thereto; ſome, at leaſt, four-tenths of an inch in length.

Dec. 31 —This evening the cold was the moſt intenſe I have obſerved it this ſeaſon; for at ten o'clock Farenheit's thermometer ſtood at 15 degrees.

January 1.—This afternoon it began to thaw, and in the night froze again, whereby, next morning, our buildings in general appeared as if they had been white-waſhed on the outſide, being caſed all over with

rhine

rhine and ice; and the inſides of garrets and outhouſes were covered in the ſame manner.

Jan. 31.—I expoſed a glaſs of proof ſpirits, impregnated with the eſſence or oil extracted from the peel of oranges, at 10 in the evening, in my garden, when Haukſbee's thermometer ſtood at 93°: At 8 next morning, I found it no way affected by the froſt; nor did there ſeem any difference either in taſte, or ſmell.

February 6.—This morning, at 8 o'clock, I expoſed, in my garden, a drinking-glaſs of water, which was completely frozen over in one minute's time; and in 15 minutes the ice was above one-tenth of an inch in thickneſs. Farenheit's thermometer then ſtood at 21 degrees.

A coarſe grey thread, two feet in length, being dipped in water, froze, in 4 ſeconds, ſo ſtiff, that I took it by one end, and held it upright, as if it had been a piece of wire.

If any part of the human ſkin, the finger, for inſtance, was wet with ſpittle, and immediately preſſed on a piece of iron, in the open air, it would be froze ſo faſt, as to ſtick to it; and, if plucked away haſtily, would endanger the tearing off the ſkin from the fleſh. I tried the ſame experiment upon lead; but the ſticking was much leſs, and to wood the finger did not ſtick at all.

In ſome places the ice was one-eighth of an inch thick, for ſeveral days together, within-ſide of our windows (and that even in rooms where fire was kept); and when the weather grew warmer, it did not fall in drops, but vaniſhed imperceptibly into the air, by which it had been brought thither.

Theſe

Theſe plates or caſes of ice were ſometimes an aſſemblage of an infinite number of particles not much unlike the ſcales of fiſhes: Sometimes they reſembled ſmall ſpines, or the cryſtal ſhootings of various kinds of ſalts; and ſometimes they repreſented a variety of landſcapes with trees and plants, from one to three or four inches in length, in ſo beautiful and admirable a manner, as neither pen nor pencil can expreſs.

Our ſtreets were now entirely covered with congealed ſnow and ice, which being very much trampled on by men and beaſts, as well as ground by carriages, a great part thereof was reduced to a kind of powder, like duſt in the ſummer-time, and would probably have been blown about, had there been a ſtrong wind to raiſe it.

I would not trouble you with the whole train of my obſervations on the late froſt, but have ſelected what I thought moſt remarkable, which, I doubt not, you will candidly accept, from, dear Sir,

Your moſt humble ſervant,

Norwich, Feb. 11, 1754.

William Arderon.

Mr. Baker having received this morning, from the Reverend Dr. Miles, F. R. S. ſome farther obſervations on the late cold weather, begs leave to add them in his own words.

*Part of a Letter from* Henry Miles, *D. D.*

Pray, Sir, have you obſerved, in the laſt *Gentleman's Magazine*, an account of a *degree of cold*, Decem. 30, near

near Bath, which to me exceeds all reaſonable belief, *viz.* 30 degrees below 0 in Farenheit's ſcale, and this at 10 o'clock *p. m.*?

The morning of December 30. here (at Tooting), a little before day, my thermometer was at 18, *i. e.* 14 degrees below 0; but at night, about 8 o'clock, no more than 8 degrees: But Feb. 7. at near 7 o'clock *a. m.* it ſtood at 14, *i. e.* 18 degrees below 0; which was the greateſt degree of cold I have obſerved in this or any other year.—I ſhould not have mentioned this account from Bath, but that the gentleman, who gives it, ſeems to have a good inſtrument, and mentions his having been converſant with ſuch matters many years. If there be no miſtake, it is an unaccountable phænomenon to me. In all my obſervations, I have found the greateſt degree of cold to be about an hour before ſun-riſing, in *time of froſt*; which is what one would reaſonably expect, *if the froſt holds all night.* I can gueſs at the cauſe of an uncommon *local warmth*, but not ſo of an unuſual degree of cold.

I have had ſome thoughts of laying a few thermometrical obſervations, I have made this ſeaſon, before the *Royal Society*, but know not whether they will be acceptable, from,

SIR,

Your very affectionate humble ſervant,

Tooting, Feb. 13, 1754.

Henry Miles.