

Viscosity of Cobbler's Wax.

FOR slowly damping a vibrating instrument of importance to the Navy, I let a metal knife cut through cobbler's wax, which is just soft enough to be squeezable between the fingers. The actual softness or hardness of the wax does not greatly matter, but what does matter is its becoming very much softer when its temperature increases from 15° C. to 30° C. This is its defect. I write in the hope that some one of your readers may be able to tell me of a suitable substance which will vary less in its softness as its temperature changes.

JOHN PERRY.

25 Stanley Crescent, Notting Hill, W.,
December 9.

The Cause of Fluted Weathering.

HAS the cause of fluted weathering, I would like to ask, ever been determined? It differs widely from all other forms of weathering that I have seen or read of. The long, smooth, parallel grooves are met with sometimes on the two sides of a block of limestone when such lies so that there are roof-like surfaces uppermost. On these two sides they frequently correspond at the ridge and follow a direct course downwards unless compelled to curve round some projecting boss.

The grooves may be 3 ft. long and of about equal



Fluted weathering in limestone, Italy. $\times \frac{1}{2}$.

width and depth along their whole course. The only specimen known to me in English museums is in the Oxford University Museum, which was got by Prof. W. J. Sollas from the Gemmi pass. I have seen good examples in the Jurassic limestone of Liguria, especially on the west of Finalmarina. Behind Pietra, on the left of the footpath to Ranza, the block, shown in this illustration, with several others, were seen. They were under olive trees, but it seemed impossible for such fluting to be produced by drip, and I wonder whether it could be the result of heavy dews or to some zoning influence.

G. ABBOTT.

2 Rushall Park, Tunbridge Wells, December 4.

Winter Thunderstorms.

THOSE of your readers who may observe thunderstorms in the British Isles during the winter months would give great assistance to an investigation of thunderstorms on which I am engaged if they would report by postcard when they observe lightning or thunder during this winter. When sheet lightning is observed at night the time and direction should be given, and a note as to whether many flashes were seen or whether there were only two or three. When

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thunder is heard the time should be given, and the direction of the storm; it should also be stated whether lightning was seen and whether rain occurred. Much useful information might be gained from winter storms, but as thunderstorms may be very local they may sometimes be missed by the official observers; I should therefore gladly welcome help from anyone who is good enough to send me information. It is obvious that only winter storms can be dealt with in this way; I would therefore ask those who are willing to help to send information up to March 31st only.

CHARLES J. P. CAVE.

Meteorological Office, South Farnborough, Hants,
December 9.

The Quadrantid Meteors.

THE ensuing display of these meteors occurs in the absence of moonlight. If the maximum continues to be at about the same position of the earth's orbit as formerly it will be in the early evening of January 3, which would be a convenient time for observation, although the radiant point is comparatively low then, the morning displays being the best.

T. W. BACKHOUSE.

West Hendon House, Sunderland, December 6.

LABORATORY ELECTRIC FURNACES.

MANY of the modern methods of chemical analysis involve the use of furnaces for the prolonged heating of materials; for example, the determination of carbon in steel, the carrying out of sealed-tube operations, etc., may be cited. Until recently, gas furnaces have almost exclusively been used for such purposes, but it seems probable that these will be largely replaced, in the future, by the improved types of electric furnace which are now obtainable. The electric furnace offers many advantages over the gas furnace, particularly in cases where it is desirable to maintain a constant temperature for any length of time.

The introduction of the comparatively new high resistance alloys of small temperature-coefficient has greatly simplified the construction and working of wire-wound furnaces. Such a furnace consists in its essential details of a tube of refractory material such as fireclay, alundum, or silica, upon which is wound a suitable length of the wire or strip; the tube is then supported in a case, the intervening space being filled with a material of low thermal conductivity, magnesia, for example. To ensure a long life and satisfactory running, attention must be paid to certain constructional details. The principal of these are:—(1) That the wire employed is as thick as possible, consistent with the dimensions of the tube and the voltage of the supply on which it is intended to be used; (2) that the wire is effectively protected from oxidation by preventing the access of air, the winding being for this purpose surrounded by a layer of powdered quartz or other suitable material; and (3) that the furnace is designed for and worked at the lowest voltage convenient.

In deciding upon the amount of lagging necessary, the purpose for which the furnace is to be employed must be considered. The provision of