primitive terrestrial magnet, and must rather look for its eauſe in local circumstances. This conclusion becomes more probable, when we learn that the deviation from the meri­dian and the deviation from the horizontal line are not affected at the same time. Van Swinden aſcribes them ſolely to changes produced on the needles themſelves. If their magnetism be greatly deranged by the sun’s poſition, it may throw the magnetic centre away from the centre of the needle’s motion, and thus may produce a very ſmall change of poſition. But if this be the cauſe, we ſhould expert dif­ferences in different needles. Van Swinden says, that there are ſuch, and that they are very great ; but as he has not ſpecified them, we cannot draw any conclusion.

But, besides this regular diurnal variation, there is ano­ther, which is subjected to no rule. The aurora borealis is obſerved (in Europe) to disturb the needle exceedingly, fometimes drawing it ſeveral degrees from its poſition. It is always obſerved to increaſe its deviation from the meridian, that is, an aurora borealis makes the needle point more westerly. This disturbance ſometimes amounts to six or ſeven degrees, and is generally obſerved to be greatest when the aurora borealis is most remarkable.

This is a very curious phenomenon, and we have not been able to find any connection between this meteor and the position of a magnetic needle. It is to be obſerved, that a needle of copper or wood, or any ſubstance besides iron, is not affected. We long thought it an electric phe­nomenon, and that the needle was affected as any other body balanced in the same manner would be ; but a copper needle would then be affected. Indeed it may still be doubt­ed whether the aurora borealis be an electric phenomenon. They are very frequent and remarkable in Sweden; and yet Bergman says, that he never obſerved any electric symptomsabout them, though in the mean time the magnetic needle was greatly affected.

We see the needle frequently disturbed both from its ge­neral annual poſition, and from the change made on it by the diurnal variation. This is probably the effect of auroræ boreales which are invisible, either on account of thick weather or day-light. Van Swinden says, he ſeldom or never failed to obſerve auroræ boreales immediately after any anomalous motion of the needle ; and concluded that there had been one at the time, though he could not see it. Since no needle but a magnetic one is affected by the aurora borealis, we may conclude that there is ſome natural connec­tion between this meteor and magnetiſm. This ſhould farther incite us to obſerve the circumstance formerly men­tioned, *viz.* that the ſouth end of the dipping needle points to that part of the heavens where the rays of the aurora appear to converge. We wiſh that this were diligently obſerved in places which have very different variation and dip of the mariner’s needle.

For the diurnal and this irregular variation, conſult the Differtations of Celsius and of Hiorter, in the *Memoirs of Stockholm ;* Wargentin, *Philoſophical Transactions,* Vol. 48. Braun (*Comment. Petropol. Novi,* T. V. VIL IX) ; Graham and Canton as above.

VARIETY, a change, ſuccession, or difference, in the appearance or nature of things ; in opposition to *uniformity.*

Variety, in botany, is a change in ſome leſs essential part or quality ; as colour, size, pubeſcence or age.—Ex­ternally ; by the plaiting or interweaving of the branches— by bundling or uniting of ſeveral stalks into one broad flat one ; by the greater breadth, or narrowneſs, or curling of leaves—by becoming awnleſs, or ſmooth, or hirſute. In­ternally ; by becoming mutilated in the corolla ; or having one larger than ordinary—by luxuriancy, multiplication, or fulneſs—by becoming proliferous, or crested—by bearing bulbs instead of seeds —or being viviparous.

The uſual cauſes of variation are, climate, soil, expoſure, heat, cold, winds, culture.

VARIOLA, the Small-pox. See Medicine, n⁰ 222 —224.

VARIX, in medicine, the dilatation of a vein, arising from the too great abundance or thickneſs of the blood.

VARNISH, a clear limpid fluid, capable of hardening without losing its tranſparency, uſed by painters, gilders, &c. to give a lustre to their works, to preſerve them and defend them from the air.

A coat of varniſh ought to posseſs the following proper­ties : I. It must exclude the action of the air ; because wood and metals are varniſhed to defend them from decay and rust. 2. It must resist water ; for otherwiſe the effect of the varniſh could not be permanent. 3. It ought not to after ſuch colours as are intended to be preſerved by this means. It is necessary therefore that a varniſh ſhould be easily extended or ſpread over the surface, without leaving pores or cavities ; that it ſhould not crack or ſcale ; and that it ſhould resist water. Now resins are the only bodies that posseſs theſe properties. Resins conſequently must be uſed as the bases of varniſh. The question which of courſe preſents itſelf must then be, how to diſpoſe them for this uſe ? and for this purpoſe they must be dissolved, as minute­ly divided as poſſible, and combined in ſuch a manner that the imperfections of thoſe which might be diſpoſed to ſcale may be corrected by others.

Resins may be dissolved by three agents. 1. By fixed oil. 2 By volatile oil. 3. By alcohol. And accordingly we have three kinds of varniſh : the fat or oily varniſh, eſſential varniſh, and ſpirit varniſh. Before a resin is dissolved in a fixed oil, it is necessary to render the oil drying. For this purpoſe the oil is boiled with metallic oxides ; in which operation the mucilage of the oil combines with the metal, while the oil itſelf unites with the oxigene of the oxide. To accelerate the drying of this varniſh, it is necessary to add oil of turpentine. The essential varniſhes consist of a ſolution of resin in oil of turpentine. The varniſh being applied, the essential oil flies off, and leaves the resin. This is uſed only for paintings. When resins are dissolved in al­cohol, the varniſh dries very ſpeedily, and is subject to crack; but this fault is corrected by adding a ſmall quantity of tur­pentine to the mixture, which renders it brighter, and leſs brittle when dry.

We ſhall now give the method of preparing a number of varniſhes for different purpoſes.

*A Varniſh for Toilet-boxes, Cases, Fans, &c.—*Dissolve two ounces of gum mastich and eight ounces of gum ſandarach in a quart of alcohol ; then add four ounces of Venice tur­pentine.

*A Varniſh for Wainscots, Cane-chairs, Iron-chairs, Grates.—* Dissolve in a quart of alcohol eight ounces of gum ſandarach, two ounces of seed lac, four ounces of rosin then add six ounces of Venice turpentine. If the varniſh is wiſhed to produce a red colour, more of the lac and leſs of ſandarach ſhould be uſed, and a little *dragon’s blood* ſhould be added. This varniſh is ſo thick that two layers of it are equal to four or five of another.

*A Varniſh for Fiddles, and other Musical Instruments.—*Put four ounces of gum ſandarach, two ounces of lac, two ounces of gum mastich, an ounce of gum elemi, into a quart of alcohol, and hang them over a slow fire till they are diſſolved ; then add two ounces of turpentine.

*Varniſh in order to employ Vermilion for painting Equipages.*

—Dissolve in a quart of alcohol six ounces of ſandarach,