but also reproduces some of the features of discrepance presented by the progress of the variation through the intermediate depths, and therefore confirms the general accuracy of the preceding results, for all the stations, so far as it might be questioned because of only five years' observations having been available. Further consideration of these results, and deduction of the conductivities of the different portions of the earth's crust involved, are deferred until after we have taken into account the further data for Calton Hill, to the reduction of which we now proceed.

V. *Meteorological Charts.* By Francis Galton, *Esq.*[*]

[With a Plate.]

WHEN contemporary meteorological reports from numerous stations are printed one after another in a column (such as we may see in newspapers and certain foreign publications), they present no picture to the reader's mind. Lists of this description are therefore insufficient to do more than supply data which meteorological students must protract as they best can, upon a map, in some notation intelligible to themselves, at a considerable expense of labour and artistic skill.

It is needless to enlarge upon the serious obstacle which the necessity of doing this opposes to the pursuit of meteorology. It has sufficed to convert what might be a very popular science into a laborious and difficult study. We require means of printing, not lists of dry figures, but actual charts which should record meteorological observations pictorially and geographically, without sacrificing detail. It is then in the belief that an attempt I have just made to supply this desideratum might interest some of your readers, and perhaps lead to useful suggestions, that I forward the accompanying chart. (Plate II). It has been printed with moveable types, which I designed and caused to be cast; and I am much indebted to Mr. W. Spottiswoode, who printed it, for his aid in carrying out my ideas. The map simply incorporates the newspaper data of the day to which it refers, and was printed, not with any scientific object, but solely for the purpose of experiment.

Explanation of the Symbols.

The shade signifies cloud, of an amount proportional to its depth. The types with lines round them, ▓, stand for rain.

Cloud types have been interpolated where observations were

wanting. The horseshoes show the direction of the wind current: thus, ⊃ means wind *from* the west. An included spot ⊃, or line ⊃, or cross ⊃, respectively signify that the wind is gentle, moderate, or strong; where neither dot, line, nor cross are inserted, the force of the wind is unknown. Thermometrical data are expressed by figures, printed below the wind symbols. The first two figures of each set stand for the height of the ordinary thermometer, and the last figure (in a different type) for the difference between this and the thermometer with a wetted bulb. To save confusion of figures, barometer heights are not inserted on the face of the present map; but lines of equal barometric pressure have been deduced from the existing observations, and the places where lines corresponding to each integral one-tenth of an inch cut the marginal columns, have been marked. Thus a straight line joining the pair of figures, 29·7, is approximately the line of that pressure.

I do not consider the types here employed as forming a complete series. An additional shade for cloud is especially wanted.

It will be observed that no space would be lost by this mode of representation, supposing we possessed observations corresponding to every type space of the map.

42 Rutland Gate, S.W.

VI. *On the Curves situate on a Surface of the Second Order.* By A. Cayley, *Esq.*[*]

A SURFACE of the second order has on it a double system of generating lines, real or imaginary; and any two generating lines of the first kind form with any two generating lines of the second kind a skew quadrangle. If the equations of the planes containing respectively the first and second, second and third, third and fourth, fourth and first sides of the quadrangle are $x=0$, $y=0$, $z=0$, $w=0$, and if the constant multipliers which are implicitly contained in x, y, z, w respectively are suitably determined, then the equation of the surface of the second order (or say for shortness the quadric surface) is $xw-yz=0$.

Assume $\frac{y}{x}=\frac{\mu}{\lambda}$, $\frac{z}{x}=\frac{\nu}{\rho}$, then $\frac{\mu}{\lambda}$, $\frac{\nu}{\rho}$, or say $(\lambda, \mu, \nu, \rho)$, may be regarded as the coordinates of a point on the quadric surface; we in fact have $x:y:z:w=1:\frac{\mu}{\lambda}:\frac{\nu}{\rho}:\frac{\mu\nu}{\lambda\rho}$, or what is the same

ENGLISH WEATHER DATA,
Feb. 9, 1861, 9h. A.M.,
by FRANCIS GALTON, F.R.S.

30·0
rise.

29·9
rise.

29·8
rise.

29·7
rise.

29·6
rise.

29·5
rise.

30·0
rise.

29·9
rise.

29·8
rise.

29·7
rise.

29·6
rise.

29·5
rise.

29·4
rise.