Analyses.

The following are analyses of the substances, but much reliance cannot be placed on them, as they are each from a single analysis of a very small quantity of substance.

I. Purple and lilac portion from interior, changing on exposure, giving off ammonia, insoluble in water, and depositing brown powder.

II. Pale blue, interspersed with white particles.

	I.	II.
Cu	21·67	26·77
Zn	32·62	33·76
Cl	27·08	26·34
CO ₃ (from CO ₂)	10·10	6·16
NH ₄	6·39	6·84
NH ₃	2·12	...
	<hr/>	<hr/>
	99·98	99·87

4. On a Peculiarity of the Diurnal Hygrometric Curve at Geneva. By Alexander Buchan, Esq.

In a work recently published by Professor Plantamour on the climate of Geneva, the hourly means of the aqueous vapour of the atmosphere for each month is given, deduced from observations made during the twenty-seven years ending with 1875. The curves drawn from these figures are undoubtedly the most remarkable of the meteorological specialties of the climate of Geneva.

Professor Plantamour endeavours to explain the facts of the diurnal hygrometric curves at Geneva by the ascending and descending currents of air consequent on the diurnal march of the temperature. These systems of air currents serve to explain a part of the phenomena in question,—but only a part, and we think a very small part. A reference to the curves at other places is sufficient to show that this explanation is insufficient. There is another cause to which the characteristic feature of the curves is due, and that cause is the diurnal changes of the wind, which

occur at Geneva, arising from its position with reference to Lake Geneva, and from the qualities of these winds as determined by the relative size of the lake.

The hourly variations in the direction of the wind show that the land and lake breezes are strongly marked—the breeze from the lake prevailing during those hours of the day when the temperature of the land is in excess of that of the lake, the land breeze during the rest of the day. In December, when the land is at no hour of the day warmer than the lake, no breeze from the lake sets in over Geneva, and also in January the breeze from the lake is but slight and of short continuance. These breezes leave their impress in a most distinct manner on the curves of the hourly variation of the vapour tension. During the winter months, when no breeze from the lake, or but a feeble one, sets in, the vapour curves show only one daily minimum, occurring about sunrise, and one maximum, about 2 P.M., whereas during the other months, from March to October, the vapour curves exhibit two daily minima, one about or shortly before sunrise, and the other from 2 to 4 P.M., and two maxima, one from 8 to 11 A.M., and the other from 6 to 10 P.M., according to season. Equally marked are the curves of the hourly variations of cloud, the maximum during the winter months occurring about sunrise, and the minimum about sunset. On the other hand, during the warm months there are two maxima and minima—the first maximum occurring about or shortly after sunrise, and the second, but by far the larger maximum, about 6 P.M., and the two minima shortly after midnight, and from 9 to 11 A.M.

The explanation of these instructive phenomena is doubtless to be found in the size of Lake Geneva, which is large enough to occasion a strong breeze during the day from the lake all round its shores. On the setting in of the breeze, the air conveyed by it, having been resting sometime previously on the surface of the lake, is necessarily moist, and while this state of matters continues the first daily maximum of vapour tension is reached. As the breeze continues, the current is necessarily drawn from higher strata of the atmosphere, and being thus but a brief interval in contact with the lake the air becomes constantly drier till the second daily minimum occurs, from 2 to 4 P.M. The breeze then gradually diminishes in force, and the air consequently becomes moister, till the maxi-

mum vapour tension of the day occurs about the time when the breeze from the lake falls to a calm, and before the land breeze springs up.

A cursory examination of the curves suffices to show that there is a close connection between their critical phases and the corresponding phases of atmospheric pressure and temperature; and the idea is suggested that in this great contribution of Plantamour's to the meteorology of Geneva, we are put in possession of data of the utmost importance as regards the relations of the vapour of the atmosphere and its movements to changes of atmospheric pressure in a way such as could be done by the observations of few observatories.

5. On Knots. By Professor Tait.

(*Abstract.*)

At the last meeting of the Society I stated that I had just procured a remarkable essay by Listing, part of which bears on the subject of knots, and that I had found in it an example of a change of form not producible by the modes of deformation I had employed.

It had for some time struck me as very singular that, though I could easily prove that (when nugatory intersections are removed) a knot in which the crossings are alternately over and under is not farther reducible, I could not prove all its possible deformations to be producible by inversions or projections of the kinds specified in my paper; but, as soon as I recognised the existence of amphicheiral forms, I saw that it was probable that they would furnish a key to my difficulty. I immediately set to work to classify the simpler of such forms; and while I was thus engaged I got the *Göttinger Studien* for 1847, in which is Listing's paper, with the title *Vorstudien zur Topologie*.

By this title Listing means *qualitative* as distinguished from *quantitative* space-relations. He commences with a study of inversion (*Umkehrung*) and perversion (*Verkehrung*),—the first being the effect of a rotation through two right angles about any axis, the second the result of reflexion in a plane mirror.

He next treats of screwing of all kinds, including twisting and plaiting.