in the form of a sharply corrugated circle, and the negative electrode was placed in the centre, so that the resistance should be low, it varied from ·2 to 4 ohms according to the liquid used. The E.M.F. was practically constant during its determination, as the current drawn from the cell was only about ·001 ampere. The minimum cell was of similar form to the maximum, only the positive electrode was in the centre and was a wire of about 0·5 mm. diameter, and the negative electrode was in the form of a cylinder. By using cells of these forms he was able easily to change either of the electrodes or the electrolyte. The method of determining the minima electromotive forces was to short-circuit the cell for several hours, and immediately on opening the circuit to determine the E.M.F. The following are some of the results that he obtained with an electrolyte of acidulated water, 2 parts in 1000 being sulphuric acid :—

Electrodes		E.M.F. in volts	
Negative	Positive	Maxima	Minima
Zinc, ordinary	Carbon	1·22 ...	0·04
,, amalgamated ...	Carbon	1·26 ...	0·226
,, ordinary	Lead	0·55 ...	0·144
,, amalgamated ...	Lead	0·684 ...	0·152
,, ordinary	Copper	0·94 ...	0·194
,, amalgamated ...	Copper	1·072 ...	0·272
,, ordinary	Iron	0·429 ...	0·309
,, amalgamated ...	Iron	0·476 ...	0·323
,, ,, ...	Zinc, ordinary ...	— ...	<0·09
Iron	Copper ...	0·49 to 0·51 ...	—

AN experimental reproduction on the screen of the phenomenon of the solar halo has been recently brought before the Physical Society of Paris by M. Cornu. M. Cornu also discussed the phenomenon of the pink corona which has been visible around the sun during the past few months. He thinks it has its seat in the atmosphere at an elevation considerably higher than the level of the cirrus clouds which give the common ring-halo of 22°. According to M. Cornu the polarisation of the sky has been "profoundly modified" by the present phenomenon, especially when viewed through red glass.

SIGNOR A. RICCO sends us a lengthy memoir on a new form of electro-magnet invented by him. It consists of a sheet of iron rolled into a spiral round an iron core, the convolutions being separated by oiled paper. The current traverses the coiled sheet, which thereby becomes powerfully magnetised. A spiral of forty turns of insulated copper wire is added outside. The lifting power of this magnet appears to be very great in proportion to its weight.

A PAMPHLET on the system of simultaneous telephony and telegraphy invented by F. van Rysselberghe has lately appeared from the pen of M. Ch. Mourlon, secretary of the Société belge d'Electriciens.

DR. E. VON FLEISCHL recently communicated to the Viennese Academy a paper on the double-refraction of light in liquids. Concentrated solutions of tartaric acid and of various sugars were employed, also certain active oils, in a compound hollow prism resembling a Fresnel's quartz combination in its general disposition. The research proves the existence of doubly-refracting liquids; but they possess no optic axis. The wave-surfaces are in every case two concentric spheres.

CHEMICAL NOTES

ATTENTION was lately drawn in these Notes to Schiff's recent researches on the connections between the capillary coefficients of various liquid carbon compounds and the structure of the molecules of these compounds (see also NATURE, vol. xxx. p. 618). The same subject has very recently been examined by J. Traube (*Ber.* xvii. 2294). Traube thinks that the differences between the various capillary elevations observed by Schiff are too small to allow of trustworthy conclusions being drawn: he has therefore undertaken a series of observations with aqueous solutions of various classes of carbon compounds. Inasmuch as the capillary elevation of water in a tube of ·34 mm. radius is about 41·5 mm., while that of most liquid carbon compounds does not exceed 25 mm., Traube concluded that there will probably be well-marked differences between the capillary elevations of aqueous solutions, and mixtures of aqueous solutions, of definite concentration, of various compounds of carbon. The height in capillary tubes was determined for each solution for varying degrees of concentration, and the results are stated for equal weights of compounds in equal volumes of solution. From these results Traube draws the conclusions :—(1) The capillary elevation of the solution of a compound decreases as concentration increases; the differences of elevation are not equal for equal increases in concentration. (2) The capillary elevations decrease in a homologous series of carbon compounds as molecular weight increases. (3) Isomeric compounds in solutions of equal concentration do not always exhibit equal capillary elevations. Schiff's generalisation, that the number of molecules of isomerides raised by capillary action is equal, does not hold good for aqueous solutions of isomerides. As in Traube's experiments the liquids examined were of equal concentration, it follows that the ratios of the capillary elevations are equal to the ratios of the masses of the dissolved compounds raised in the capillary tubes. Calling the capillary elevation h, and the specific gravity of the solution s, Traube considers the product hs, which he calls the capillary coefficient of the solution. The value of h is conditioned by the chemical constitution of the compounds examined. If m = molecular weight of compound in solution, then the difference between $\frac{h}{m}$ for solutions of two compounds, within certain limits of concentration, is a constant which depends only on the relative concentrations of the two solutions. The values of $\frac{h}{m}$ for an homologous series, dealing with solutions containing equal masses of the compounds in equal volumes, are referred to the value of $\frac{h}{m}$ for the first member of the series, and the differences thus obtained, when calculated for a tube 1 mm. radius, are called the *specific capillary constants* of the compounds in the series. The values of this quantity are almost wholly dependent on the nature of the solution, perhaps only on the nature of the dissolved substance, and are independent, within certain limits, for each homologous series, of the absolute concentration of the solutions, and are scarcely, if at all, dependent on temperature. Traube thinks he is justified from his experimental results in concluding that the differences between the capillary elevations of the solutions of two analogous compounds are in the same ratio as the molecular weights of the compounds. Thus, let h_α and $h_{\alpha 1}$ represent the capillary elevations of two solutions, of different concentrations, of the compound with molecular weight m; and let h_β and $h_{\beta 1}$ represent the capillary elevations of two solutions, of the same concentration as those of the former compound, of an analogous compound with molecular weight m_1. Then, according to Traube,

$$\frac{h_\alpha}{m} - \frac{h_{\alpha 1}}{m_1} = \frac{h_\beta}{m} - \frac{h_{\beta 1}}{m_1};$$

therefore

$$\frac{h_\alpha - h_{\alpha 1}}{h_\beta - h_{\beta 1}} = \frac{m}{m_1}.$$

If, therefore, h_α, $h_{\alpha 1}$, &c., are determined, the ratio $\frac{m}{m_1}$ can be found; and if m is known, the value of the molecular weight of the second compound (m_1) can be calculated.

GEOGRAPHICAL NOTES

WE are glad to see that at last there is some probability of the almost unknown but certainly interesting country of Tibet being opened up to outsiders. We know the frequent but unsuccessful efforts which Prjevalsky and others have been recently making to penetrate to Lassa. But now the *Times* Calcutta correspondent informs us that the Regent of the Tashu Lama at Shigatze has sent a most cordial reply to the letter which Mr. Macaulay despatched to him from the frontier through the agency of the Governor of Kambajong, and has also addressed a letter to the Viceroy. With these letters, besides the silk scarves which ordinarily accompany Tibetan correspondence, the correspondent understands he has sent some relics of the late Tashu Lama himself, and has asked Mr. Macaulay to send him a Tibetan-English dictionary and phrase-book and some scientific instruments. This is the first official communication received from Tibet for about a hundred years. The correspondent suggests that the Government should put our relations on a firm footing by sending at once a friendly mission in connection with the identification which takes place this year of the infant in whom Tashu Lama is supposed to have been born again.