is invariable in tint and disappears by inclination of the body. Such instances are no real exceptions, but are due to the reflecting plates being curved, or having pigmentary matter beneath them, or an opalescent medium above them. In this way some of the most extraordinary and beautiful colour effects it seems possible to conceive are produced.

In examining objects with the perforated mirror a single light is necessary. The sun is of course the best, and the electric light probably almost as good. I frequently employ the lime-light, but a good paraffin lamp may be used as a substitute. Ordinary gas is unsuitable. The light should be placed in front of the observer, its direct rays being prevented from falling on the objects by means of a book or partition of some kind resting on the table, and of such a height that the light can be seen above it. On placing the mirror to the eye the light may be reflected from the mirror on to the object, and the latter manipulated so as to reflect the ray back through the perforation in the mirror to the eye. The incidence is thus known to be normal, and the colour observed is the one to be recorded.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The following letter has been addressed by the University of Cambridge to that of Padua, which is about to celebrate the tercentenary of Galileo's professorship :—

Universitas Cantabrigiensis Universitati Patavinae S.P.D.

Litteras vestras, viri doctissimi, GALILAEI GALILAEI Professoris vestri celeberrimi in laudem conscriptas vixdum nuper perlegeramus, cum statim in mentes nostras rediit non una Italiae regio viri tanti cum memoria in perpetuum consociata. Etenim nostro quoque e numero nonnulli urbem eius natalem plus quam semel invisimus, ubi Pisano in templo lucernam pensilem temporis intervallis aequis ultro citroque moveri adhuc iuvenis animadvertit ; etiam Vallombrosae nemora pererravimus, ubi antea scholarum in umbra litteris antiquis animum puerilem imbuerat ; ipsa in Roma ecclesiam illam Florentinam intravimus, ubi doctrinae suae de telluris motu veritatem fato iniquo abiurare est coactus ; Florentiae denique clivos suburbanos praeterivimus, ubi provecta aetate caeli nocturni sidera solus contemplabatur, ubi extrema in senectute diei lumine orbatus cum MILTONO nostro collocutus est, ubi eodem demum in anno mortalitatem explevit, quo NEWTONUS noster lucem diei primum suspexit.

Hodie vero ante omnia non sine singulari voluptate sedem quandam doctrinae insignem, intra colles Euganeos urbemque olim maris dominam positam recordamur, ubi trecentos abhinc annos saeculi sui ARCHIMEDES discipulorum ex omni Europae parte confluentium numero ingenti erudiendo vitam suam maturam maxima cum laude dedicavit ; ubi, ut LIVII vestri verbis paulum mutatis utamur, ultra colles camposque et flumen et assuetam oculis vestris regionem late prospiciens, caelo in eodem, sub quo vosmet ipsi nati estis et educati, instrumento novo adhibito inter rerum naturae miracula primus omnium Lunae faciem accuratius exploravit, Iovis satellites quattuor primus detexit, Saturni speciem tergeminam primus observavit, ultraque mundi orbem ingentem a Saturno lustratum fore suspicatus est ut etiam alii planetae aliquando invenirentur.

Ergo vatis tam veracis, auguris tam providi in honorem, nos certe, qui Professorum nostrorum in ordine planetae etiam Saturno magis remoti ex inventoribus alterum non sine superbia nuper numerabamus, hodie alterum ex Astronomiae Professoribus nostris, Georgium DARWIN, nominis magni heredem, nostrum omnium legatum, quasi Nuntium nostrum Sidereum, ad vosmet ipsos libenter mittimus. Vobis autem omnibus idcirco gratulamur quod tum Italiae totius, tum vestrae praesertim tutelae tradita est viri tanti gloria, qui divino quodam ingenio praeditus rerum naturae in provincia non una ultra terminos prius notos scientiae humanae imperium propagavit quique caeli altitudines immensas perscrutatus mundi spatia ampliora gentibus patefecit. Valete.

Datum Cantabrigiae
a. d. viii *Kal. Decembres*
A. S. MDCCCXCII.

Mr. F. Darwin has been appointed Deputy Professor of Botany for the current academical year, Prof. Babington being unable to lecture on account of the state of his health.

SCIENTIFIC SERIALS.

American Journal of Science, November.—Unity of the glacial epoch, by G. Frederick Wright. An examination of the evidence in favour of two successive glacial epochs separated by an inter-glacial epoch, during which the glaciated area was as free from ice as it is at the present time. This evidence is shown to be inconclusive, at least as far as American observations go.—A photographic method of mapping the magnetic field, by Charles B. Thwing. Iron filings are strewn upon the film side of a dry plate laid horizontally in a magnetic field, and the plate is exposed to light from above. The filings are then brushed off, and the plate developed. From the negatives excellent lantern slides may be obtained.—Contributions to mineralogy, No. 54, by F. A. Genth, with crystallographic notes by S. L. Penfield. Description and analysis of aguilarite, metacinnabarrite, döllingite, rutile, danalite, yttrium-calcium fluoride, cyrtolite, lepidolite, and fuchsite.—The effects of self-induction and distributed static capacity in a conductor, by Frederick Bedell, Ph.D., and Albert C. Crehore, Ph.D.—The quantitative determination of rubidium by the spectroscope, by F. A. Gooch and J. I. Phinney. The method is that of comparing photometrically the intensity of a certain line in the spectrum of the metal under investigation with the intensity of that given by a standard solution containing a known amount of the metal. A definite amount of the salt solution—usually the chloride—is taken up by a hollow coil of platinum wire, which may be made to take up constant quantities of liquid by taking care to plunge the coil while hot into the liquid, and removing it with its axis inclined obliquely to the surface. The coils were made of platinum wire 0·32 mm. in diameter, wound in about thirty turns to a spiral 1 cm. long by 2 mm. across, and twisted together at the ends to form a long handle. Each coil held 0·02 gr. of water. With such a coil, the blue rubidium lines were produced in a Muencke burner from 0·0002 mgr. of the chloride. Some test experiments showed that in the case of pure solutions of rubidium chloride the percentage could be found spectroscopically up to 1 part in 30,000 with an error as low as 1·25 per cent. In presence of potassium or sodium, however, the error may be as great as 20 per cent.—Notes on the meteorite of Farmington, Washington County, Kansas, by H. L. Preston.—A note on the cretaceous of North-western Montana, by H. Wood.—A deep artesian boring at Galveston, Texas, by R. T. Hill.—Notice of a new Oriskany fauna in Columbia County, New York, by C. E. Beecher, with an annotated list of fossils, by J. M Clarke.—Description of the Mount Joy meteorite, by E. E. Howell.—Influence of the concentration of the ions on the intensity of colour of solutions of salts in water, by C. E. Linebarger.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, November 17.—"Stability and Instability of Viscous Liquids," by A. B. Basset, F.R.S. (Abstract.)—The principal object of this paper is to endeavour to obtain a theoretical explanation of the instability of viscous liquids, which was experimentally studied by Professor Osborne Reynolds.[1]

The experiment, which perhaps most strikingly illustrates this branch of hydrodynamics, consisted in causing water to flow from a cistern through a long circular tube, and by means of suitable appliances a fine stream of coloured liquid was made to flow down the centre of the tube along with the water. When the velocity was sufficiently small, the coloured stream showed no tendency to mix with the water; but when the velocity was increased, it was found that as soon as it had attained a certain critical value, the coloured stream broke off at a certain point of the tube and began to mix with the water, thus showing that the motion was unstable. It was also found that as the velocity was still further increased the point at which instability commenced gradually moved up the tube towards the end at which the water was flowing in.

Professor Reynolds concluded that the critical velocity W was determined by the equation

$$Wa\rho/\mu < n,$$

where a is the radius of the tube, ρ the density, and μ the viscosity of the liquid, and n a number; but the results of this

[1] *Phil. Trans.* 1883, p. 935.