cult to see from the drawing what is meant in the arrangement figured between the washing bottle and the French drying tube. There are some traces also of careless printing, which it would be well to rectify in future editions, as in the equation of the action of arseniuretted hydrogen on silver nitrate on p. 372. The title of the book is also somewhat presumptuous; it is styled "A Manual of Practical Chemistry:" the two last words being in large type; a colon is here introduced and then follows the exact title of the book in smaller type, "The Analysis of Foods and the Detection of Poisons." The work cannot be fairly described as a Manual of Practical Chemistry, and the title should therefore have been restricted to the matter actually contained in the book.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.*]

On the Spectrum of Brorsen's Comet

WITH reference to Prof C. A. Young's Note on the Spectrum of Brorsen's Comet, in NATURE, vol. xix. p. 559, it may be of interest to mention that observations made at the Royal Observatory, Greenwich, confirm his conclusion as to the coincidence of the brightest band in the comet spectrum with the green band of carbon.

We were not able to examine the comet's spectrum till April 17, as the Great Equatoreal was in the workmen's hands till that date for alterations required to allow of the more convenient use of the spectroscope. On that evening, and again on April 19, the comet's spectrum was repeatedly compared by Mr. Maunder and myself, with the spectrum of alcohol taken in a vacuum tube. The less refrangible edge of the brightest comet-band coincided as exactly as could be determined with the corresponding edge of the green carbon-band at 5,200, but the comet-band was very much wider, extending two-thirds of the way towards F (*i.e.*, about 200 tenth-metres), and covering the carbon-band at 5,200 (about 30 tenth-metres broad) and the two following fainter bands at 5,100 and 5,020. The comparisons were made on April 17 by the help of an occulting bar, and on April 19 with Hilger's bright-line micrometer, illuminated by red light. With the latter, readings for the comet- and carbon-bands respectively, agreed within half a tenth-metre. The half prism spectroscope with a dispersion of 10° from A to H (equivalent to two prisms of 60°) was used on the 13-inch equatoreal. From spectroscopic observations of the carbon compound, printed in the volume of Greenwich Observations, 1875, it appears that the bands in the spectrum of alcohol are identical with those in the spectra of olefiant gas, and of carbon oxide and dioxide.

A second band was seen in the orange of the comet's spectrum approximately coincident with the carbon band at about 5,600. This band was of about one-fourth the brightness of the principal band.

The results on April 17 were obtained without a knowledge of Prof. Young's work, and thus afford an independent confirmation of his conclusion. W. H. M. CHRISTIE

Royal Observatory, Greenwich, April 21

Blue Flame from Common Salt

I AM perfectly aware that, as Dr. Gladstone points out in your last issue, I have not *proved* HCl to be the origin of the blue flame, but I will give some of my reasons for *thinking* so.

In the first place I conclude every one will admit that chlorine in some form must be present, since only chlorides produce the flame. At one time I thought it was due to dissociated or atomic chlorine; that view, however, I discarded in favour of the hydrochloric acid theory.

When AmCl is heated, dissociation occurs, as is well known, NH_3 and HCl being formed; the HCl then plays its part in producing the blue flame. If calomel be used, it is natural to imagine that the mercury and chlorine are separated, and if the colour is due to HCl, the addition of hydrogen will be necessary before the flame is produced. As a matter of fact I have found that no coloration occurs if the calomel is heated in what I may perhaps be allowed to call the *solid* part of the Bunsen flame, *i.e.* where complete combustion takes place, but it is necessary to allow some of the unburnt gas to mingle with its vapour. In practice I adjust the wire gauze over the burner so that a black spot is seen surrounded by a red hot ring, a little calomel placed on the dark spot volatilises and colours the gas that is burning above the gauze; if the gauze is raised so that the dark spot vanishes and all is red hot, the salt volatilises without any coloration ensuing.

Although I have not been able to see any violet bands when a spark has been taken in HCl, I do not consider that it negatives my theory, since there is a considerable difference between an electric spark and a Bunsen flame, and I now have reason to think that under the influence of the spark the HCl is split up into its components, which will fully account for the absence of violet bands. I have likewise failed to get them from a spark in AmCl.

A drop of liquid HCl, introduced into a Bunsen flame by the aid of a platinum wire, gives a flash of blue colour, and a lighted taper immersed in a bottle of HCl gas has its flame surrounded by a blue mantle just before it goes out. The colour, to the eye, is identical in both cases to that produced by the volatilisation of a chloride, the peculiar violet tinge showing that it must contain rays of high refrangibility.

Lastly, if a stream of HCl gas be slowly passed into a large Bunsen flame, the colour is produced most vividly, the spectrum showing all the characteristic lines or bands. Here we have the HCl under the same conditions as the chloride and with a similar result.

Dr. Gladstone appears not to have obtained the flame by this method, since he says: "Hydrochloric acid passed into a flame never gives the violet light."

This may probably be explained by the fact that if the HCl be passed too rapidly the violet coloration gives place to green, similar to that produced by chlorine alone if the stream of gas be allowed to slacken, the violet is reproduced, and this may be repeated indefinitely. A. PERCY SMITH

Temple Observatory, Rugby, April 26

Did Flowers Exist during the Carboniferous Epoch?

ACCORDING to the position Mr. Wallace has taken in the discussion as to the order of insects to which *Breyeria borinensis* presumably belongs, everything depends upon the existence or non-existence of transverse reticulation. I re-assert that a regular and thoroughly well-marked transverse reticulation exists over all the wing.

If Mr. Wallace prefers to believe in the evidence afforded by a photograph in preference to my statement based upon actual examination, and to M. de Borre's words in his description ("Entre toutes ces nervures s'étend un réseau extrêmement complet de très-fines nervules allant transversalement d'une grosse nervure à l'autre"), it is evident that anything I could say would not alter his opinion.

Further, I utterly fail to comprehend by what process of reasoning he arrives at the conclusion that the photograph "is so beautifully sharp that it brings out the minutest details," when confessedly he has not compared that photograph with the original.

That the main nervures may be compared with some forms in Lepidoptera and found to agree to a certain extent is very possible; it would be singular if it were otherwise, considering the extreme variation in the neuration of Lepidoptera, and the practical certainty that the system of neuration in all orders of insects can be homologised. The presence of dense *transverse* reticulation in a lepidopterous insect would decidedly be an anomaly; but its absence would not prove that any particular fossil *did not* belong to the Ephemeridæ, for in some recent genera of the latter, such as Oligoneuria, Lachlania, &c., the transverse reticulation is so far absent as to be reduced to a few nervules that might be counted on the fingers of one hand.

Supposing, for the sake of argument, that my assertion may be based upon false premises (and no one is infallible), *Breyeria* would probably be relegated to that heterogeneous assemblage of extinct forms of insects possessing densely reticulate wings, to