1. A little common salt was placed in a crucible, inclosed in a jacket, and exposed to the Bunsen flame. The fringe of flame appearing above the crucible was of course coloured most intensely yellow.

2. A similar arrangement was made, only that the crucible contained a mixture of common salt and powdered charcoal. Although the crucible was heated to a redness, the flame had lost most notably its intense yellow colour and occasionally a slight blue tinge appeared around the edge. This last I do not lay much stress on, as it might be merely due to the Bunsen flame; but the diminution of the sodium colour could not be overlooked.

3. The crucible was now filled with a mixture of salt and powdered charcoal, together with a very little of sulphide of iron (in fact, the substance used for the preparation of sulphuretted hydrogen), and exposed over the Bunsen burner as before. In this case the sodium coloration almost completely disappeared, while the blue flame became very distinct indeed.

No difference could be observed, whether the air was turned on or off the burner, in these experiments.

When the above mixtures were exposed on platinum wire in the naked flame, they only gave the sodium colour. This is doubtless to be ascribed to the stronger heat volatilising some of the sodium salt before it had time to enter into the necessary changes. This is the more likely, because mixtures made with just the slightest trace of salt gave the yellow colour in the naked flame, while the mixtures used in the crucible as described, and which gave the blue colour, contained fully 50 per cent. of salt.

Dr. Schuster, in the note already mentioned, refers to a paper by Dr. Gladstone (*Phil. Mag.*, 1862, vol. xxiv., p. 417), on the similar behaviour of certain metallic chlorides in imparting a blue or violet colour to flames of various kinds. I find that in this paper the violet colour given by the chlorides of potassium, sodium, and barium, in the flame of red-hot coals is noticed, Dr. Gladstone remarks, however, that "a doubt must rest on such observations made with a common coal fire, as it is quite conceivable that these chlorides may give up their chlorine to the alkalies or earths of the ash.

It struck me that it would have some bearing on the matter, to ascertain if other salts of sodium exhibit the same phenomenon. On trial I find that there is no difference.

A little pure sulphate or carbonate of sodium thrown on a coal fire produces exactly the same blue flame as common salt, both with ordinary coal and with anthracite. These salts, in the flame of the Bunsen or the spirit-lamp, give the strong yellow flame of sodium at once. It is clear that their behaviour on hot coals is explainable in exactly the same way as that of common salt, viz., by the production of carbonic oxide. It is inferable, therefore, that the blue flame of common salt is not to be ascribed solely to some property inherent in chlorides alone; and the solution I have proposed seems the more plausible.

A correspondent in NATURE suggested the probable formation by a reaction between common salt and *copper pyrites* in the coal, of chloride of copper, and that the last would give the blue flame. However, it is iron pyrites, and not copper pyrites, that occurs in coal; and, moreover, the flame of copper chloride is bluish green, and not blue.

EDWARD T. HARDMAN,
Kilkenny Her Majesty's Geological Survey

OUR ASTRONOMICAL COLUMN

THE INTRA-MERCURIAL PLANET QUESTION.—Notwithstanding the suspicious aspect of the spot remarked upon the sun's disk by Weber at Peckeloh, on the afternoon of April 4, 1876, as it is described by him in his letters to Profs. Heis and Wolf, it would appear that it must be relegated to that class of ordinary solar spots which are better defined than in the majority of cases, and continue visible but a short time. A letter has been addressed to the Abbé Moigno by Señor Ventosa, of the Observatory at Madrid, containing a very definite observation of a spot on that day which was evidently the one noticed at Peckeloh. A similar letter to Prof. Peters is published in *Ast. Nach.*, No. 2106.

It is not, perhaps, generally known in the astronomical world that the systematic observation of the sun's disk forms one of the routine subjects to which attention is directed at the Madrid Observatory. The observations are made daily with the large Merz-Equatoreal, projecting the image of the sun upon a screen so as to present one of considerable diameter. The heliographic positions of the spots are determined on the method adopted by the late Mr. Carrington on the image projected by the finder, which is provided with a suitable reticule, and, whenever possible, their distances from the limb are measured directly with the large telescope. The drawings are made by hand.

After noon on April 3 the sun was without spot, a group of *facula* only being visible very near the S.W. limb. But on the morning of April 4 there was a small spot, a simple nucleus without penumbra, of an apparently elliptical figure, with a small *facula* on the N.W. side (puro nucleo sin penumbra, de figura eliptica aparentemente, y con une fácula pequena por el lado N.O.); this was very well observed. Cirrus was scattered over parts of the sky, but the images were well defined. The observations gave the following results:—

April 3 at 22h. 9m. 54s. M.T., at Madrid, angle of position of the spot, 76° 43′, distance from the centre of the disc 818″·9, the sun's semi-diameter being taken at 960″ 9. At 22h. 24m. direct measure of the distance of the spot from the sun's limb gave 147″, consequently 814″ for the distance from the centre. The dimensions of the spot were 4″ × 2″.

April 5, after noon, the sun was again without spot; the most remarkable object was a bright *facula* very near the N.E. limb. It will be seen that the first Madrid observation was made 5h. 7m. previous to that at Peckeloh.

The opinion expressed by M. Leverrier before receiving the Madrid observation, that certain problematical solar-spot observations upon record might accord with a revolution of an intra-mercurial planet in about twenty-eight days, in which case an inferior conjunction might fall on the 2nd or 3rd of the present month, has been construed into a definite prediction of a transit of the so-called *Vulcan*, on one of those days, a prediction which M. Leverrier distinctly repudiates, though it has been widely circulated by the daily press in and out of France. The rejection of the observation of April 4 in the present year leaves us in doubt again as to what period will correspond to the most reliable data, assuming the existence of an inter-mercurial planet.

Mr. Wray's observations about midsummer, 1847, and others of hardly less authority, require explanation. It is impossible to repudiate them, but whether referable to the passage of planetary or cometary bodies, must remain for future decision.

THE VARIABLE STAR, ALGOL.—The following are Greenwich times of visible geocentric minima of Algol to the end of the year, calculated from the elements in Prof. Schönfeld's latest catalogue of variable stars:—

	h.	m.		h.	m.
Oct. 20 ...	16	42	Dec. 2 ...	16	55
23 ...	13	21	5 ...	13	44
26 ...	10	20	8 ...	10	33
29 ...	7	8	11 ...	7	22
Nov. 12 ...	15	13	22 ...	18	38
15 ...	12	2	25 ...	15	26
18 ...	8	51	28 ...	12	15
21 ...	5	40			

THE MINOR PLANETS.—It appears by a telegram from Vienna in the Paris *Bulletin International*, of September 23, that Herr Palisa, of the Observatory at Pola, has recovered No. 66 of the group of small planets—Maia—detected by Mr. Tuttle, at Cambridge, U.S., though at some distance from the position given in the *Berliner Jahrbuch* for 1878.

The following names are proposed for recent discoveries:—No. 165, discovered August 9, 1876, Loreley; No. 166, August 15, Rhodope; No. 167, August 28, Urda. Nos. 168 and 169 are announced; the former was detected by Prof. Watson on September 27, and the latter by M. Prosper Henry on the following night near the same position. Both are eleventh magnitudes.