

has been a "black-board" subject in most, if not all, schools; and for this neglect there is little excuse, for a great number of most important experiments may be made without more expenditure than in the case of ordinary quantitative analysis.

A somewhat similar plan of work to the one in this little book has been followed for the last three or four years at the summer course of the Normal School of Science, and no doubt other Colleges where chemistry is a leading subject will have adopted some plan of practical organic instruction. The publication of this book will save some trouble to teachers in directing the preparations. The book is divided into two parts, and, curiously enough, what is generally considered the easier, viz. marsh-gas derivatives, are put in the second part. The author gives as his reason for this, that the selected examples offer fewer difficulties. That is a matter of opinion to some extent, and may depend on the course of lectures the student is hearing at the time.

In Part I., after the purification of alcohol, ether, benzene, and short descriptions of boiling-point determination and fractional distillation, we pass on to formation of benzene derivatives, commencing with bromobenzene, ethyl benzene, &c., to typical members of different families, ending with ethyl benzoate. The descriptions of process to be followed are short, but generally to the point, and are preceded in each case by references to the literature on the subject, which is a very valuable addition, and should be useful to beginners. The appendix, consisting of notes on the preparations, is very good, but would have been better placed, probably, in the text, or in connexion with the most typical substance of a group or family. As to the physical constants, melting and boiling points and specific gravity only are mentioned. Surely a great number of substances, the preparation of which is described, allow of their vapour-densities being taken by Victor Meyer's method? Beyond that there is little to complain of. The book is fairly well adapted for its ostensible purpose.

*My Microscope.* By a Quekett Club Man. (London: Roper and Drowley, 1887.)

It is impossible to give in a small volume of some sixty pages a clear description of the microscope and the wonders it reveals. Still the author has managed to make his little essays interesting; and if there is not much depth in his work, he has perhaps written enough to induce some of those who are not already the possessors of a microscope to get one. It is surprising that he has not laid more stress on the advantages of a binocular over a monocular instrument.

#### 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 insure the appearance even of communications containing interesting and novel facts.]

#### Sun and Fire Symbolism.

THERE is a phase of sun and fire symbolism in our very midst which seems hitherto to have received but little attention, viz. the presence of such symbols as crests or in the coats-of-arms of many of the oldest noble families and landed gentry of the British Isles. We find them in the greatest numbers in the armorial bearings of our Scottish families, and those belonging to the most northern counties of England; probably for the same reasons that they are most numerous on objects which

have been found in the northern portions of Scandinavia, *i.e.* that the light and warmth of the sun were naturally prized in such districts, and also because they have there survived longer, owing to the isolated position of the inhabitants depriving them of free intercourse with the outer world.

In a letter in NATURE (vol. xxxv. p. 558) headed "The Svastika both as Sun and Fire Symbol," I gave illustrations of some of the emblems of the sun and of the svastika as a fire symbol, and also alluded to the wheel as being in use in some countries to this day as a preservative against fire. A type of fire symbol exists in some parts of England at our very doors. In Gloucestershire and Herefordshire—possibly also in some of the other south-western counties of England—it is not an uncommon circumstance to see on the external walls of some of the older

houses one or two pieces of iron in this form



and sometimes thus



It seems evident that they

could not have added much support to the building, since they were bolted on to it at one point only—the centre.

A most interesting explanation of them was given a few years ago by an old servant of our family who died about five years ago; his age went with the century. He was a Gloucestershire

man, and on being asked the reason of the



form of

these irons, he replied "that they were made thus in order to protect the house from fire, as well as from falling down."

In the little village of Kingstone, in Herefordshire, it is still the custom for the people on the eve of May-day to take two

short pieces of wood and nail them in this form



over

the door of a house or a stable, removing the one of the previous year. On inquiry why this was done, the reply was, "To scare the witches or the evil spirits away."

In the crests and armorial bearings of many of our families we find at least three distinct forms of sun and fire symbolism.

- (1) The sun in splendour.
- (2) Fire, represented sometimes by a mountain in flames.
- (3) The sun as a ring, or as a simple circle, the heraldic terms for this latter type being amulets (Collins's "Peerage of England," London, 1779) and annulets (Sir Bernard Burke's "Peerage, Baronetage, and Knightage," London, 1880).

I propose now to give examples of a few of the most typical of each kind.

Blount, Bt.—This family is of French extraction, and formerly Lords of Guisnes, in France; their crest is an armed foot in the sun. Motto, *Lux tua via mea.*

Blunt, Bt.—Probably originally the same family. These latter have for a crest the sun in glory, charged in the centre with an eye, issuing tears.

In the Earl of Clancarty's arms—the Trenches came from Poitou in 1575—on the first and third quarters is the sun in splendour, and in the centre an escutcheon with the coronet of a Marquis of the Netherlands, charged with a wheel with six spokes. (The wheel is still used as a preservative against fire, both in Holland and in Denmark.)

Musgrave, Bt., of Hayton, has, for his crest, two arms in armour embossed, sustaining the sun; so has also Musgrave, Bt., of Tourin, co. Waterford; and their arms are the same.

The rising sun and the sun in his splendour is also borne—

By the Marquis of Lothian, by the Earls of Stamford and Warrington, by Lords Polwarth and Hammond—Lord Polwarth's crest is a lady richly attired, holding a sun in her right hand and a half moon in her left; and it also forms the crest of Tyrwhitt, Bt., Fairbairn, Bt., the Earls of Antrim, Nicholson, Bt., where it is placed between two stars of eight points, and of many more families.

We find fire symbols in connexion with the sun in the armorial bearings of Macleod of Lewis. Their crest is the sun in splendour, and in their arms they have a mountain in flames on the

first quarter and the three-legged Manx man in the second quarter; the motto belonging to this latter is *Quocunque jeceris stabit*.<sup>1</sup> The Duchess of Sutherland (Countess of Cromartie) bears this symbol in her arms for Macleod, in the first and third quarters.

The crest of the Earls of Seafield is a salamander in flames; the Marquis of Hertford has a phoenix in flames out of a ducal coronet; Mackenzie of Scatwell, co. Ross, has on the second quarter of his arms a rock in flames, and on the third quarter three legs of a man armed, for Macleod of Lewis; Lord Ongley, a phoenix in flames holding in its beak a fire-ball; Verney, Bt., a demi-phoenix in flames looking at the rays of the sun; and Carmichael, Bt., has in the second and third quarters of his arms, a cup with flames of fire issuing therefrom.

We will now turn to the third portion of our subject—the sun as a ring, or a simple circle—bearing in mind that the former type is in heraldry called *amulets* or *annulets*, and that the simple circle is styled a *bezant*.

The Earl of Lonsdale has in his coat-of-arms six annulets forming a triangle; the Earl of Bantry one annulet in the first, and ten bezants in the fourth quarter of his coat-of-arms; Barron, Bt., on a Saltier gu., five annulets. Amory Bagge, and Bailey, Bts., bear also annulets.

In the possession of a member of the writer's family is a seal of rock crystal, on which is the motto *Luceo non uro*;<sup>2</sup> beneath this is a baron's coronet (for the Barony of Strange, which came to the Dukes of Athole through the female line), and below this, again, the sun in glory. It is believed (but none are now living who know this for a fact) that this seal formerly belonged to Marjory, second wife of the fourth Duke of Athole, eldest daughter of James, sixteenth Lord Forbes, and widow of John Lord Macleod, who died s.p. in 1789; she married the Duke in 1794, and died in 1842, having had by him a son and a daughter who predeceased her.

The Isle of Man belonged at one time to the Macleods—when, is apparently not known—but in 1405–6 it came into the possession of the Stanleys (afterwards Earls of Derby), through Sir John Stanley, Kt., who in conjunction with Roger Leke received a commission to seize the city of York and its liberties, and also the Isle of Man upon its forfeiture by Henry Percy, Earl of Northumberland. The Stanleys held the Isle of Man until the death of Ferdinand, the fifth Earl, without male heirs, when the Barony of Strange—which title had been borne by the second Earl, who died in 1522—fell into abeyance between his daughters, and the earldom went to his brother William, sixth Earl, who bought from his nieces their claims on the Isle of Man. His son, again, the seventh Earl, was summoned to Parliament in 1627 as Baron Strange, under the impression that his father had enjoyed it; this was, however, not the case, and the summons was virtually a new peerage, which eventually devolved upon the ducal house of Athole, through the marriage of Amelia Anna Sophia, youngest daughter of the seventh Earl of Derby, by his wife Charlotte de la Trémoille, daughter of the Duc de Thours in France, with John, second Earl and first Marquis of Athole. Failing male heirs to her father, Charlotte, daughter of the second Duke of Athole, became Baroness Strange on his death in 1764, and also succeeded to his rights in the Isle of Man. She married her cousin, John Murray, who became the third Duke.

Another seal, also in the writer's family, has an impression which differs essentially from the armed legs of the Isle of Man. It is known to have been the private seal of the fourth Duke. The Manx emblem correctly described is "the three legs of a man armed ppr. conjoined in the centre at the upper part of the thighs, placed in triangle garnished and spurred or": but on this seal the three legs are bare, and conjoined in the centre by a sun with rays. In fact, it is the trinacria of Sicily.

HARRIET G. M. MURRAY-AVNSLEY.

### Bishop's Ring.—The Sky-coloured Clouds.

DURING a recent visit to the Alps I carefully looked for Bishop's ring, and found that it was generally visible at high altitudes in the middle of the day when the sky was clear. On the whole, the higher one ascended, the plainer it was, up to a height of 9000 feet, beyond which I did not go. On one occasion it was visible nearly or quite as low down as Chamounix,

<sup>1</sup> Signifying, "However you throw me I stand." This is true of the swastika, a fire symbol likewise.

<sup>2</sup> "I give light, but I do not burn."

altitude 3400 feet; but this was the lowest point I saw it from. It was always extremely faint, so much so that if I had not seen it previously in its greater brightness I should not have noticed it at all,—indeed, it could usually only be detected by a careful comparison of the colour of different parts of the sky. Its dimension seems the same as heretofore.

About sunrise and sunset this circle continues occasionally conspicuously visible here, but it is long since I saw it in the middle of the day, when the sky has been really clear; sometimes, however, I have seen a similar circle, but with much duller colours and extremely feeble, giving one the impression that it was lower in the atmosphere than Bishop's ring as caused by the volcanic dust, and that it might be caused by smoke.

Last evening, and still more this morning, there was a bright display of the "sky-coloured clouds" (if I may so call them). I seldom or never saw them more brilliant than they were this morning, when I observed a circumstance as regards their colour that I have not noticed before: the greater part of them was coloured as usual, the lower part a dull yellowish green, and the upper part a bright, though light, blue; but there was a border of yellow above the blue, very faintly lit up it is true, but unmistakable. The display was almost confined to that part of the horizon between north-north-east and north-north-west, the cloud-mass evidently not extending further east or west to any extent, and the upper border after 2 a.m., at least, was evidently the actual southern edge of the cloud sheet.

I had the opportunity of watching these clouds gradually fade away in the increasing daylight, showing that in all probability they did not evaporate, but simply became invisible owing to the increasing light of the sky, and perhaps also to their losing light themselves. It is again evident, therefore, that they are of an exceedingly filmy and transparent nature, and indeed can hardly be considered real clouds at all.

Their motion was very slow, but appeared on the whole much as usual—viz. from a north-easterly direction.

Sunderland, July 30.

T. W. BACKHOUSE.

### The Electricity of the Contact of Gases with Liquids.

SINCE the delivery of Helmholtz's famous Faraday Lecture, "the charge on the atom" has been assumed by physicists, notwithstanding the very serious objections urged by Maxwell against such a theory. A re-perusal of the latter, some eighteen months ago, excited me to make some experiments on the subject. It occurred to me that by allowing such solutions as potassic iodide and chlorine water to react in an insulated vessel some information might be obtained as to the equality or inequality of the atomic charges.

My object at present is not to give an account of the many experiments of this kind which I made, but briefly to call attention to one result to which they led, and I shall describe only such experiments as are necessary for this purpose.

One of the electrodes of a quadrant electrometer was "put to earth," the other was connected to an insulated stand on which was placed a porcelain dish containing a small quantity of distilled water. The instrument was in a rather sensitive state. A high-resistance Daniell, through which a current never passed, gave a deflection of 94 divisions either way. A small fragment of potassium was cast on the water. The spot went rapidly to the left, indicating a negative charge on the porcelain dish, and a positive charge on the escaping hydrogen. A second fragment of K was thrown on the liquid in the insulated dish. The spot moved 28 divisions to the left, then turned and went up the scale to the right 300 divisions. A third piece of K was thrown on the liquid in the insulated basin, and the spot moved 40 divisions to the right. This behaviour was extremely perplexing. The connexions were looked up, and the experiment repeated with like irregular results.

Na was used instead of K, and although the deflections then obtained were also irregular, the tabulated results showed a contrast. When Na was used, 40 per cent. of the deflections were *first* to the left; when potassium was used, 70 per cent. of the deflections were *first* to the left. Speaking broadly, this seemed to indicate that with K the hydrogen came off charged positively, with the sodium it came off charged negatively; and as I thought that such a result would throw some light on the atomic charges I tried very hard to eliminate what I then believed to be accidental exceptions, and to prove that in reality such was the case. But I tried in vain.

Retaining the same method of testing the electrification, other