As the manufacture has improved, and the wire assumed a degree of ductility unknown in samples a year ago, this difficulty has become greatly reduced, and especially in the case of the ribbon, which I have seen burn steadily for half-an-hour without sign of intermission. Perfect certainty of combustion (dispensing with the spirit-lamp) has been ensured by the use of a double strand of wire or ribbon—it being exceedingly improbable that the flame of both should go out at the same instant, and in the event of one being extinguished, it would be re-lit by the other. One of Grant's lamps paying out a double strand has burned for two hours without cessation; and it is only necessary that the reels of magnesium and the clockwork be enlarged to secure a continuous light for any requisite time.

Captain Bamber, R.N., of Clarence House, Jersey, has been making a variety of experiments in order to adapt magnesium to common use in mines, tunnels, and railways. His instrument consists of a mahogany box, about eighteen inches long, containing a series of small wheels (much resembling those of a musical box), and a drum, round which the wire is wound, and from which the burner is supplied at a rate proportionate to the revolution of the drum, whose action is governed by a regulator. The burner is enclosed by a powerful lens, or "bull's eye." Captain Bamber exhibited this instrument one night lately at the Paddington Railway Station, and though the thinnest ribbon manufactured was used, the time was easily read off a watch at the distance of 250 yards.

There is manifestly much more to be accomplished in the matter of lamps. We require apparatus whereby a hall or picture-gallery can be illuminated for the evening. This, one would say, should be effected by burning the magnesium overhead from the centre of the ceiling; but the disposal of the smoke and ash, consisting of pure magnesia, is the difficulty—a difficulty, however, which has only to be stated to be met and overcome. Already some ingenious mechanics are tackling it hopefully.

It is a question whether magnesium in filings has met with due attention. It would not be difficult to deliver a stream of metal as sand from an hour-glass into a jet of gas or other flame, and thus maintain a light with a certainty equal to that obtained by wire and clockwork.

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A peculiarity of the magnesium light is, that it leaves colours unaffected—that is, it displays them as in sunshine. This may be verified with agreeable effect by burning a piece of wire at night in a garden or conservatory, when it will be found that greens and blues, yellows and whites, reds, violets, and purples, appear with perfect distinctness. This fortunate quality has led to the employment of the light by dyers and silk mercers as a ready means of settling questions as to shades of colour either at night or in foggy weather.

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To the utilization of magnesium no one has brought such experience and such resources as Captain Bolton. As is well known, he devised the oxy-hydrogen signal-apparatus introduced to H. M.'s service some three years ago. The credit attached to this success would have tempted many a man into the position of an obstructive; but Captain Bolton having arrived at the conviction, based upon actual experiment, that the magnesium light possessed all the necessary attributes for a perfect naval and military signal light, equally with the electric and lime light, and with decided superiority over them in the grand requisite of handiness, he at once avowed his conviction, and set to work to apply its powers to the best advantage.

In the first place, in conjunction with Captain Colomb, he has succeeded in introducing magnesium powder into signal-lights for use in the mercantile marine. These lights are intended to burn on the port or starboard sides of vessels entering port during thick or foggy weather. They last 3, 5, or 8 minutes, and longer lights from 12 to 15, and are distinctly visible at a distance of eight miles. The cost is trifling.

The Mercantile Marine Association of Liverpool have lately recommended that a powerful red light be made as the signal for danger at night. This recommendation Captain Bolton and Captain Colomb have met, again by the use of magnesium in powder. They have prepared a red light to burn about 15 minutes at a cost of 1*s.* 6*d.* It is visible in clear weather at a distance of ten miles. The signal is now under consideration by the Association.

A greater interest, however, belongs to Captain Bolton's efforts to supersede the oxy-hydrogen light by the combustion of magnesium in simplicity, in wire or ribbon. His apparatus for this purpose is not yet complete, and until it is, it would be unfair to him to prejudice it by description. Suffice it to say, that he has succeeded in consuming or suppressing the smoke, and with a few more adjustments will accomplish clipping off the ash which gathers on the point of the burning strand of magnesium, and sadly dims its glory.

With all imperfections, Captain Bolton has found it easy to signal with magnesium from Shoeburyness to the "Great Eastern," eight miles off; and from Portsmouth to St. Catherine's Downs, Isle of Wight, a distance of sixteen miles.

Supposing Captain Bolton should fully attain what he proposes, it will lead to the employment of magnesium in all the ships and light-houses of Europe. Rid magnesium of its smoke and ash, and there is no light to compare with it in other respects.

The manufacture of magnesium has been commenced in Boston, and from the men of Massachusetts, who are said as babies to lie awake and scheme improvements and patents in the construction of cradles, we are likely to hear of some novel applications of the metal. If the contest in which they were engaged had not so happily ended, we should have heard ere this a great deal about the utility of magnesium in war. We were startled in reading last February, in 'The Times' and other papers, that blockade-running was about to receive an unexpected check, for it had been found possible to remove the veil of night by the blaze of magnesium fire. In a rough way it may be said, that to us in England novelty is a prejudice to be overcome, but to Americans novelty is a recommendation.