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Sodium.	
D	Feb. 28, 1869.
Barium.	
1989·5 Kirchhoff's scale,	March 14, 1869.
2031·2 " "	July 5, 1869.
Magnesium.	
b 1, 2, 3, 4,	Feb. 21, 1869.
Iron 1474,	June 6, 1869.
? 1515·5,	" "
A brilliant ray 1529·5,	July 5, "
? 1567·5,	March 6, "
? 1613·8,	June 6, "
Iron 1867·0,	June 26, "
A brilliant line 1871·5,	" "
Iron 2001·5,	" "
? 2003·4,	" "
? Band or lines 2054·0,	July 5, "

—*Comptes Rendus*, lxix, 121. W. G.

5. *On the ultra violet Spectra.*—MASCART has examined the spectra of metals with special reference to lines beyond H, employing photography as a means of recording his observations. In this manner he has detected more than 100 new coincidences of iron and solar lines, in addition to the 450 observed by Angström in the visible spectrum. No coincidences could be observed with certainty for cadmium, though six very intense rays appeared also to exist in the solar spectrum. Mascart further calls attention to the occurrence, in different parts of the spectrum, of similar groups of lines belonging to the same element. Thus he observed in 1863 that the six principal rays of sodium observed by Wolf and Diacon are all double, and that the two rays of each group are at about the same distance as those of D. Magnesium, as is well known, gives the group of 3 rays *b*. In the ultra violet spectrum of the same metal there are two other remarkable groups. One, situated near L, can be seen by the eye without difficulty. It consists of 3 rays disposed in the same manner and at about the same distances as the three lines in *b*. These rays also exist in the solar spectrum. The other group is situated between P and Q and is also found in the solar spectrum. It has the same form as *b* but the rays are rather more widely separated. The wave lengths of the least refrangible rays in the three groups are respectively 518·2, 386·4 and 333·5. The author thinks that this repetition of the same phenomenon in different parts of the spectrum cannot be the result of chance, but depend on the molecular constitution of the luminous gas.—*Comptes Rendus*, lxix, 337. W. G.

6. *On the spectrum of the Aurora Borealis.*—In our notice of the spectral lines of the aurora borealis of April 15, 1869, given on p. 123 of vol. xlviii of this Journal, it is stated that 5 lines were seen. For 5 we should read 7, the places on Mr. Huggins' scale being

1280 brightest
1400
1550
1680
Near F
2640
Near G

We are indebted for this correction to Mr. Charles S. Peirce by whom the observations were made.

The brightest line is fully 20 times as bright as any other. The faint lines should perhaps be called bands rather than lines as they exhibit an appreciable breadth. On June 6th 5 lines were seen, the brightest being 1280 of Mr. Huggins' scale. W. G.

7. *On a new element associated with Zirconium.*—The existence of absorption bands in the spectra obtained from light transmitted through certain specimens of zircon was first observed by Prof. Church in 1866 and a notice of his results published in the Intellectual Observer, vol. ix, p. 291. The same bands have been recently observed independently by Mr. H. C. Sorby, who has inferred from them the existence of a new element to which he gives the name of jargonium. The natural silicate of jargonium is almost, if not quite, colorless but gives a spectrum exhibiting more than a dozen narrow black lines more distinct than even those of didymium. The borax bead gives no absorption bands, but by flaming crystals of borate of jargonia are formed, and the spectrum then shows four absorption bands unlike those of any other known substance. Another remarkable property of jargonia is that its compounds may exist in three different crystalline states, giving three wholly different spectra. The spectrum of the borax bead after flaming may easily be seen with the spectrum microscope which thus enables us to detect less than one per cent of jargonia in zircons. The spectrum, however, is different according to the temperature to which the bead has been subjected. Jargons from Ceylon of density 4·70 contain very little jargonia, but those of density 4·20 contain about 10 per cent, in a form which gives hardly a trace of absorption bands. On keeping such a specimen for some time at a high red heat the density increases to 4·60. The mineral then gives a spectrum with 13 narrow black bands and one broader line. No such changes occur with zircons from Miask which are free from jargonia. Mr. Sorby and Mr. David Forbes have both succeeded in making an approximate separation of jargonia by purely chemical methods, but their results must be considered only as first attempts and necessarily very imperfect.—*Proc. of the Royal Society*, xvii, 511. W. G.

8. *Additional observations on Hydrogenium.*—When a palladium wire is allowed to occlude hydrogen its length increases and from the corresponding increase in volume Graham determined the density of the occluded hydrogen to be about 2. It is now found, however, that the wire after the expulsion of the hydrogen undergoes a permanent shortening about equal in amount to the