apparently been overlooked. The compound formed seems to have a very complex formula, being represented by $C_{17}Cu_8H_4O_8$. It is more explosive than the corresponding cuprous compound and, unlike it, on treatment with dilute acid yields very little acetylene. It gives, on the contrary, a humus-like substance of a formula of about $C_{12}H_4O_3$, which resembles both humic acid and the so-called graphite hydrate obtained from the graphite of cast iron. It would seem to be an unique case of the condensation of acetylene, at ordinary temperature under the influence of a copper salt, to a compound of high molecular complexity.

J. L. H.

ASTROPHYSICAL NOTES.

In No. 367 of the Proceedings of the Royal Society is a note by Professor Oliver Lodge, read on February 11th, in which he calls attention to the notable discovery by Professor P. Zeeman, of Amsterdam, that lines in the spectrum of a flame may be broadened when a magnetic field is concentrated upon the flame.

Zeeman's paper appears in the *Philosophical Magazine* for March (Vol. 43, pp. 226–239). He alludes to the fact that similar experiments were the last researches of Faraday, in 1862. With the relatively slight dispersion then available, however, the effects could not have been observed.

Sodium and lithium were used by Zeeman, and the broadening effects were observed in both the emission and absorption spectra, which were obtained from a powerful concave grating.

The experiment was also tried on the band spectrum of absorbing iodine vapor, with negative results, which, however, confirmed the accuracy of the experiments with sodium. The widening of the sodium lines to both sides amounted to about $\frac{1}{40}$ of the distance between D_1 and D_2 (that is, to about 0.15 tenth-meters). As the intensity of the magnetic field was about 10^4 c.g.s. units, there would be a positive and negative magnetic change of $\frac{1}{1000}$ of the period.

The theory of the motion of ions or electrons, whose vibrations are those of light, is discussed according to the views of Professor Lorentz, who pointed out to Zeeman that if the theory was true the edges of the widened lines ought to be circularly polarized in the direction along the lines of magnetic force, and plane polarized in directions normal to the lines of force. This was clearly shown by experiment to be the case, and it has been confirmed by Lodge, who also readily obtained the broadening effect in the sodium flame.

These researches are decidedly suggestive, and have an important astrophysical as well as physical application. The view is held by many that strong magnetic forces occur in the sun (and hence by analogy in the stars). Thus a new cause may perhaps be assigned for the wide range and variations in the breadth and intensity of spectral lines of celestial bodies.

E. B. F.

SCIENTIFIC NOTES AND NEWS.

LEGISLATION ON THE FOREST RESERVATIONS.

The Senate, on May 6th, adopted Senator Pettegrew's amendment to the Sunday Civil Appropriation Bill, suspending President Cleveland's order of February 22d, setting aside some 20,000,000 acres of timber lands in the Northwest as forest reservations. The N. Y. *Evening Post* calls this action 'monstrous,' and it seems to be generally misunderstood. The Senators from the States concerned favor forest reservations, but President Cleveland's order, with the laudable purpose of adequately celebrating Washington's Birthday and securing to his administration the credit of this important movement, seems to have been premature. The letter from the Secretary of the Interior to the President of the National Academy of Sciences requested an official expression of the Academy upon the following points: