In the face of facts such as these, Mr. McAtee would do well to reconsider his sweeping assertion that "Ants are not rejected either relatively or absolutely by any potential predators".

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¹ 'B.P.U.', NATURE, 130, 66, July 9, 1932.

² McAtee, Smithsonian Miscellaneous Collections, 85, 7; 1932.

³ Nicholson, NATURE, 130, 696, Nov. 5, 1932.

⁴ Uvarov, NATURE, 130, 696, Nov., 1932.

⁵ Cott, Proc. Zool. Soc. Lond., 471; 1932.

The New Infra-Red Band System of the CO Molecule

THE transition of the CO molecule from the upper electronic state of the Hopfield-Birge absorption bands to the upper level of the Cameron bands, gives rise to a system of bands degraded towards the red, and extending from the infra-red region to about $\lambda 5660$ Å. These new bands, as they were called, were photographed by Asundi,¹ who also gave their gross vibrational analysis. On Asundi's plates the bands showed a diffuse multiplet structure. Measurements were made only on the first and the last heads.

It does not seem to be generally known, however, that McLennan, Smith and Peters² previously recorded the same bands as a series of triplets, using different conditions of excitation. The wave numbers of the first and the third head in each of the triplets agree closely with those of Asundi's, and in addition, measurements on the second head are also available. Making use of the equation given by Estey³ for the new bands, McLennan's results fit in well in the expression:

$$V = (9284) + (1173n' - 9n'^2) - (1726 \cdot 5n'' - 14 \cdot 4n''^2) \\ 9235 \\ 9233$$

The value (9284) in the above equation, for the electronic energy of the second band-head, is obtained from the triplet separations as observed by McLennan.

In addition to all the transitions recorded by Asundi, those corresponding with (9, 2) (10, 2) (11, 2) (10, 3) and (11, 4) are to be noticed in McLennan's data, but transitions (2, 0) and (4, 1) are missing.

Johnson⁴ and Asundi⁵ put forward the view that the final level of these bands which is the same as the third positive and the associated bands is a quintet level, while Birge⁶ and Mulliken⁷ hold that it is a triplet one. It is of interest therefore to note that in the light of McLennan's results, the level appears to be a triplet one, unless some bands too faint for observation were missed. The unweighted mean of the triplet separations in the direction of the degradation of the bands is 37 and 46.

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¹ Proc. Roy. Soc., 124, 277; 1929.

² Trans. Roy. Soc. Canada, 19, 39; 1925. Also, "Tables Annuelles Internationales de Constantes", vol. 7, Pt. 1, p. 697; 1930.

³ Phys. Rev., 35, 309; 1930.

⁴ Trans. Faraday Soc., 25, 649; 1929.

⁵ Loc. cit.

⁶ Phys. Rev., 28, 1157; 1926.

⁷ Rev. Modern Phys., 4, 53; 1932.

Absorption Spectra of Metallic Colloidal Solutions, and Emission and Absorption of Metallic Films

Absorption of solutions and films. The absorption curve of films of silver has been recently published by Mohler¹; and we have recently published the

absorption curves of colloidal solutions of silver and gold.² The absorption curves of the colloidal solutions of silver and of the films of this element are almost exactly coincident, as may be seen on Fig. 1, where the axis of the ordinates for curve I (solutions of colloidal silver) shows the values of $\log I/I_0 = \alpha d$, and for curve II (silver film at a temperature of 300° K) the values of $\log J/J_0 = (4\pi n k x / \lambda) \log e$. The agreement between these curves confirms Mie's theory³ that metallic colloidal particles have the same

FIG. 1.

optical properties as a macroscopic mirror of the same substances.

Emission and absorption of the films. The films of tungsten, aluminium, beryllium, gold-calcium alloy, thorium and platinum bombarded with 7 volt electrons emit, according to Mohler and Beckner,⁴ radiations similar in their intensity and in its distribution; the distribution of the spectral energy is constant between 6,400 Å. and 2,400 Å. Exceptions to this characteristic property are offered by copper,

FIG. 2.

which shows a marked increase of emission in the red, and silver, which emits strongly between 3,600 Å. and 3,200 Å., the maximum emission being at this latter wave-length (Fig. 1, Curve III), which is near the maximum of absorption. In this instance there appears to be a relation between the maxima of emission and absorption. On the other hand, in the case of colloidal solutions of gold, there is no relation between the maxima of absorption and the spectra of emission of the films bombarded with electrons. In Fig. 2, curve I represents the absorption of colloidal solutions of gold (Bredig method), curve II