the bands of the same electronic transition but of total quantum number 3.

It may, therefore, be stated that Zeeman patterns of the ortho-helium bands confirm the idea that the peculiarities of some of these bands, in particular those with large values of n and with l greater than λ for the series electron, can be explained by a gradual uncoupling of l from the molecular axis with increasing rotation. The Zeeman patterns offer a new means of following the progress of the uncoupling.

A complete report of data and results will be presented at a later date.

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The Alleged Production of Adsorbed Films on Tungsten by Active Nitrogen

Pure molecular nitrogen has no effect on the thermionic emission from tungsten. The decrease in emission that occurs if a discharge is passed through the nitrogen with voltages above about 20 has been attributed to the formation of a film of adsorbed nitrogen.[1] Kenty and Turner found that the accommodation coefficient for heat conduction from the tungsten surface by nitrogen was increased about 20 percent by this treatment.

More recent experiments in this laboratory have shown that the film produced on the tungsten by active nitrogen is an *oxygen* film. The active nitrogen, coming into contact with the walls of the tube and the surfaces of electrodes, decomposes adsorbed water vapor or metallic oxides which are almost always present and thus drives oxygen (probably atomic) into the gas phase, whence it reacts with the filament. With great care to avoid oxygen and with the bulb cooled in liquid air, active nitrogen does not produce any adsorbed film which alters the electron emission or the accommodation coefficient, but instead it is able to remove any oxygen film already present.

A similar evolution of oxygen from well baked out glass surfaces occurs when neon metastable atoms strike the walls of a discharge tube.

The detailed description of these experiments will soon be submitted to the Journal of the American Chemical Society for publication.

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March 24, 1931.

[1] I. Langmuir, Phys. Rev. **2,** 460–72 (1913); Phys. Zeit. **15,** 523 (1914); J. Amer. Chem. Soc. **38,** 2279 (1916); C. Kenty and L. A. Turner, Phys. Rev. **32,** 799–811 (1928).

Partial Absorption of X-Rays

Ray,[1] Majumdar,[2] and Bhargava and Mukerjie[3] have found evidence that a quantum of x-rays may, in passing through matter, give *only a part* of its energy to a bound electron and continue in its original direction with diminished frequency. These authors do not give detailed information regarding their experiments, but Ray reproduces spectrograms which clearly show the lines which he ascribes to *partially absorbed* x-rays. Ray estimates the intensity of these lines to be between 1/400 and 1/500 of that of the parent line.

[1] B. B. Ray, Nature **125,** 746 and 856 (1930); **126,** 399 (1930); Zeits. f. Phys. **66,** 261 (1930).

[2] R. C. Majumdar, Nature **127,** 92 (1931).

[3] S. Bhargava and J. B. Mukerjie, Nature **127,** 273 and 305 (1931).

Cork[4] and Lindsay[5] have tried to produce these modified lines, but with negative results. Cork claims to have been able to detect lines, if present, of 1/1000 to 1/3000 of the intensity of the parent line. Lindsay reproduces photometric curves of the K-spectrum of copper taken through a carbon absorbing screen which show definitely the presence of the $K\alpha_{3,4}$ satellite of copper, known to have about 1/400 the intensity of the α_1 line, but no trace of a modified line.

We have tried to find lines corresponding to the partial absorption of the $K\alpha$ doublet of molybdenum by aluminum, but without success. We used the spectrometer and calcite

[4] J. M. Cork, Comptes Rendus **192,** 153 (1931).

[5] G. A. Lindsay, Nature **127,** 305 (1931).