

MATHEMATICS

Chairman: L. H. WHITCRAFT, Ball State Teachers College
Paul Overman, Purdue University, was elected chairman for 1949.

ABSTRACTS

PHYSICS

Chairman: J. C. HENDRICKS, Franklin College
Ancil R. Thomas, Valparaiso University, was elected chairman for

ABSTRACTS

Metastable Atomic States in Gas Discharges. K. W. MEISSNER, Purdue University.—The behaviour of a discharge through gases can be considerably influenced by the presence of atoms in metastable states. A simple experiment with a glow discharge in very pure neon strikingly shows such an influence in the following manner.

A glow discharge is maintained in a simple discharge tube of 25 millimeter diameter and 150 millimeter length which has been filled with very pure neon of about 5 mm Hg. The operating voltage is chosen in such a way that the discharge remains just stable. As soon as the glowing neon tube is irradiated with light of an intensive neon discharge tube the glow discharge becomes unstable and goes out. The explanation of this behaviour can be found in the fact that the number of metastable atoms is greatly reduced by absorption of certain wavelengths of the irradiating source.

Investigations With a Reflection Echelon Grating. DELMAR O. DAVIS, K. W. MEISSNER, Purdue University.—The performance of a reflection echelon grating made by Adam Hilger, Ltd., London, was investigated.

The possibility of changing from a "double-order" pattern to a "single-order" pattern by changing the geometrical conditions instead of the commonly used change of air pressure is discussed and the idea was tested experimentally. It was found that a slight change of the angle of incidence allows one to produce a change of a whole order. This fact is of great importance for investigations in the vacuum ultraviolet.

The accuracy of wave length measurements is not affected by the choice of the angle of incidence as was shown by wave length measurements of krypton and neon lines.

Last, the effective resolving power of the reflection echelon was determined by using the Zeeman effect of the 5570 Å krypton line. The smallest Zeeman splitting which could be resolved by the echelon was taken as the limit of resolution. It was found that the reflection echelon achieves, in practice, the theoretical resolving power.