# SCIENCE

**A Weekly Journal devoted to the Advancement of Science, publishing the official notices and proceedings of the American Association for the Advancement of Science, edited by J. McKeen Cattell and published every Friday by**

THE SCIENCE PRESS

**11 Liberty St., Utica, N. Y. Garrison, N. Y.**

**New York City: Grand Central Terminal**

**Single Copies, 15 Cts. Annual Subscription, $6.00**

**Entered as second-class matter January 21, 1922, at the Post Office at Utica, N. Y., under the Act of March 3, 1879.**

VOL. LV FEBRUARY 17, 1922 No. 1416



## THE SPECTROSCOPY OF THE EXTREME ULTRA-VIOLET[1]

In the year 1914 I published a monograph under the title of "The Spectroscopy of the Extreme Ultra-Violet"; to-day I wish to trace the progress of the subject to the present time. The part of the spectrum with which we are concerned has for its less refrangible limit wave-length 2,000 A.U.; it now extends to a region separated from X-rays by less than 200 units.

It is more than thirty years ago since Victor Schumann led the way into this undiscovered country, and gave his name to the region he explored. His methods and his results are familiar to all spectroscopists, but it may be well to remind you of the nature of the difficulties which he conquered. The extension of the spectrum in the ultra-violet is opposed by three factors, the opacity of the materials usually employed in the making of prisms and lenses, the opacity of gelatine, and the opacity of the air. By the use of fluorite, by the invention of a special photographic emulsion and by placing his spectrograph in vacuum, Schumann demonstrated that the spectrum could be extended by nearly eight hundred units.

The result, though easily described, was only reached after years of patient toil, for experimentation in this region was, and still is, beset with great difficulties. Every contribution which Schumann made to the subject is marked by the greatest exactness and finish; his field was limited, but within that field not only his technique but also his reasoning remain a model to this day.

The first and most characteristic product of his labors was a series of exquisite spectrograms of hydrogen; but owing to the lack of a dispersion curve for fluorite, it was out of the question to attach wavelengths to the lines

[1] Address of the president of the American Physical Society, Toronto, December, 1921.