date has not been definitely decided upon, but will be about December 12, 1919.

THE French branch of the Ramsay Memorial Fund, which is to commemorate the work of the late Sir William Ramsay, is asking for contributions to a fund of one million francs (£40,000) for the purpose of founding Ramsay Memorial Fellowships in chemical science, similar to those to be founded in Great Britain, such French fellowships to be available for bringing to England for purposes of research chemists trained in the universities and technical colleges of France. An appeal is being made throughout France. The French branch, of which Mr. Lloyd George is president, includes among its committee M. Pichon, M. Deschanel, Lord Derby, Lord Hardinge of Penshurst, Lord Bertie, and Sir George Riddell. The cost of founding each fellowship will be £6,000. It is hoped by their means to enlist the influence of the universities of the two countries in promoting helpful international relations. The appeal in France is being directed specially to British and American residents there, and to the large number of persons of all nationalities who have for many months past been in France, while performing duties connected with the Peace Conference.

THE current agricultural appropriation bill carries the following items, largely to be devoted to scientific research in applied agriculture:

Weather Bureau	$1,880,210
Bureau of Animal Industry	5,783,231
Bureau of Plant Industry	3,379,638
Forest Service	5,966,869
Bureau of Chemistry	1,391,571
Bureau of Soils	491,235
Bureau of Entomology	1,371,360
Bureau of Biological Survey	742,170

This reaches a total of $21,006,284 out of the entire appropriation to the Department of Agriculture amounting to $33,900,211. The growth of the sums expended in research work under the Department of Agriculture has been enormous of late years, and seems to have been fully justified by results:

UNIVERSITY AND EDUCATIONAL NEWS

THE building for the Kansas University Medical School for which $200,000 was appropriated by the recent legislature, will be erected provided the city of Rosedale furnishes the additional ground needed, which is valued at $60,000.

EXCAVATION has been begun for a $70,000 engineering laboratory at the Oregon Agricultural College. It will be a two-story structure 220 by 63 feet and of brick and concrete construction.

MRS. ALICE JESSIE SHEPPEE has given £2,000 to Oxford University for the foundation of a scholarship in engineering science.

DR. W. W. CHARTERS, dean of the College of Education at the University of Illinois, has resigned to accept a position with the Carnegie Institute of Technology as professor of education to do research work in connection with curriculum organization and construction.

DR. C. A. FISCHER, of Columbia University, has been appointed Seabury professor of mathematics and astronomy at Trinity College, Hartford.

J. P. Fairbank, B.S.C., University of Nebraska, who has been assistant professor and acting head of the department of agricultural engineering in the college of agriculture at the State College of Washington, Pullman, Wash., has been promoted to professor and head of the department of agricultural engineering.

DR. CHARLES W. EASLEY, head of the department of chemistry at the University of Maine, has accepted a chair at Syracuse University. He is to be succeeded at Maine by Dr. Charles A. Brautlecht, of the Florida State College for Women, Tallahassee.

MR. H. M. SHOWMAN, of the Colorado School of Mines, has been appointed assistant professor of mathematics in the Case School of Applied Science.

DR. LEONARD DONCASTER, F.R.S., has been appointed to the Derby chair of zoology in Liverpool University.

Mr. G. G. Henderson, M.A., D.Sc., LL.D., has been appointed to be Regius professor of chemistry in the University of Glasgow, in the room of the late Professor John Ferguson.

DISCUSSION AND CORRESPONDENCE

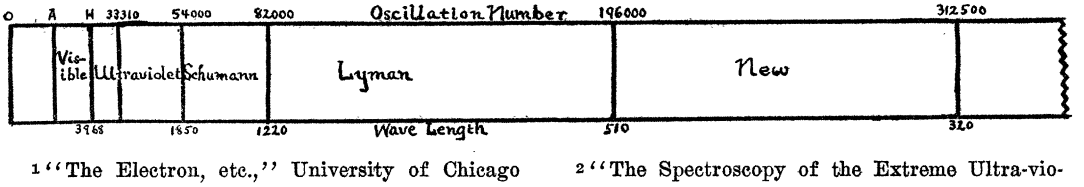
THREE FOURTHS OF AN OCTAVE FARTHER IN THE ULTRA-VIOLET

In the *Physical Review* for August, 1918, Vol. 12, p. 167, we made a preliminary report upon a new method of obtaining grating-spectra in vacuo devised by one of us in the expectation of extending the limits of the ultra-violet spectrum. This report was made because both of us were engaged in war activities, and could not then push further the very significant results which we had already obtained—results which brought to light some 30 new zinc lines, the shortest wave-length among which had a value of 928 Ångstroms.

There is every reason to believe, however, that every element except hydrogen will emit line spectra corresponding to waves of higher frequency than this, the limiting frequency for a given element pushing farther and farther into the ultra-violet, the higher the atomic weight of the element.[1] With a properly chosen source therefore, the limit to the observable ultra-violet spectrum ought to be set solely by the properties of the grating and by those of the medium through which the radiation passes. Heretofore, it has been set by the limitations of the source and the properties of the absorbing medium. We felt that we had removed these limitations entirely by working in a very high vacuum with a type of source altogether new in vacuum spectrometry, and one which enabled us to use enormous energies in the highest attainable vacuum. In our preliminary report we stated that we had "indications of zinc lines of shorter wave-length than 928Å though no positive proof as yet."

Immediately upon release from the service we had a new grating constructed so as to obtain the maximum possible brilliancy, and a new and very efficient diffusion pump, so as to eliminate altogether, if possible, the appearance of all glow discharges and enable very high potentials (up to several hundred thousand volts) to be used in producing our hot sparks in vacuo. We hoped thus to bring up the intensities of the very short lines. We also eliminated from the vacuum chamber certain gas evolving bodies like ebonite which had appeared to limit our exposure times by reducing the periods during which we could operate our hot sparks without giving rise to glow discharges, and which in addition had very injurious effects upon our grating.

As a result of these improvements we are now maintaining an exhaustion of about 10^{-4} mm. of mercury while the arc is running. We have thus brought to light a considerable number of new zinc lines below 928Å of such wave-lengths as to add up to date three fourths of an octave to the ultra-violet spectrum directly accessible to study with a grating spectrometer. We shall be in position at a very early date to publish a series of actual photographs, but in this preliminary report will content ourselves with stating that we have ten definite reproducible zinc lines below 500 Ångstroms the shortest having a wave-length of 320 Ångstroms. It is interesting to note by reference to the accompanying figure which is an extension of one given by Lyman[2] that this represents an extension in frequency of about four times that accomplished by Schumann, namely, 82,000 — 54,000 = 28,000, and a trifle more than that represents thus far in Lyman's work, namely,



1 "The Electron, etc.," University of Chicago Press, 1917, p. 202.

2 "The Spectroscopy of the Extreme Ultra-violet," Longman's, 1914, p. 105.