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## New Charts for the Radioactive Series

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RESULTS OF THE FIRST COOPERATIVE COLLEGE  
PHYSICS EXAMINATION SPONSORED BY THE  
AMERICAN ASSOCIATION OF PHYSICS  
TEACHERS

C. J. LAPP

The Committee on College Examinations for the American Association of Physics Teachers, working in conjunction with the Cooperative Test Service, which is sponsored by the American Council of Education, have prepared two forms of an objective examination over mechanics, sound and wave motion. This examination was given to the students in fifteen cooperating colleges at the end of the first semester; involving more than 1000 students. The results of this cooperative examination will be discussed.

A second cooperative examination is now being prepared by the Committee for use at the end of the second semester.

STATE UNIVERSITY OF IOWA,  
IOWA CITY, IOWA.

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NEW CHARTS FOR THE RADIOACTIVE SERIES

C. J. LAPP

Very little that is new has been contributed to the arrangement of the three radioactive series in the past fifteen years. Recently Gamow and others have pointed out the desirability for a fourth series. Fred Allison and his co-workers have recently examined radioactive matter by a magneto-optical technique and report that they find 90 radioactive electrons and isotopes. These are arranged in four series. Substantial changes are made in arrangements of the three old series, particularly the actinium and the thorium series.

STATE UNIVERSITY OF IOWA,  
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PIEZOELECTRIC MEASUREMENTS OF CRYSTALS  
WITH A HIGH SENSITIVITY LEVER

GEORGE FINK

For the measurement of piezoelectric deformations of quartz and tourmaline plates an amplifying lever system was designed and built. A lever ratio of 1864 to 1 combined with an optical