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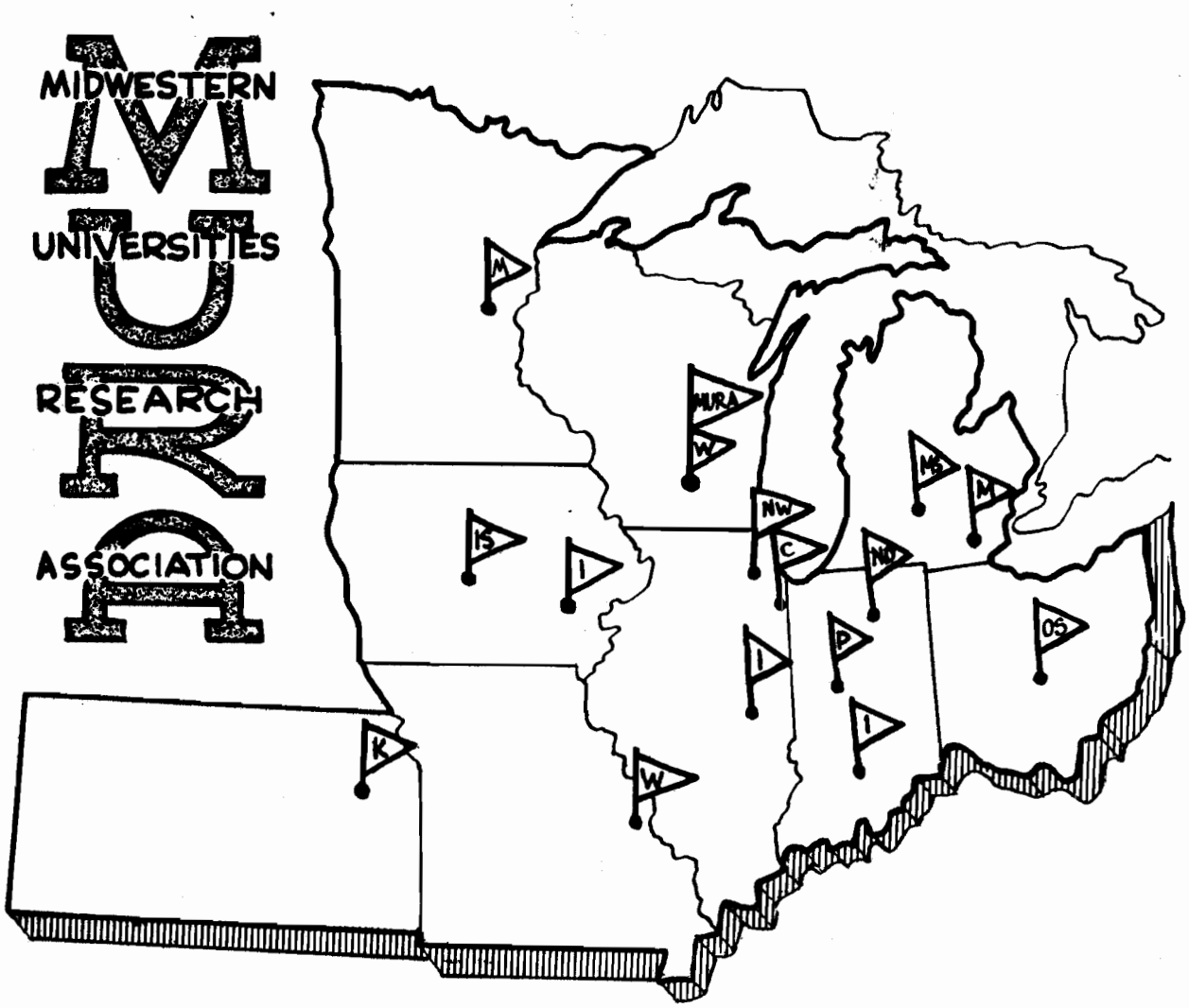

REPORT ON A VISIT TO UNIVERSITY COLLEGE, LONDON

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MIDWESTERN UNIVERSITIES RESEARCH ASSOCIATION*

2203 University Avenue, Madison, Wisconsin

REPORT ON A VISIT TO UNIVERSITY COLLEGE, LONDON

R. O. Haxby,** L. J. Laslett,+ and K. R. Symon

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**On leave from Purdue University.

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A group under R. E. Jennings at University College, London, have constructed several electron microtrons. The small energy spread and the ease with which a good quality beam can be extracted from the microtron make it an attractive instrument for electron scattering experiments. It is interesting to note that the theoretical advantage in the microtron which is of particular interest to MURA, namely that it can operate CW with a very large duty factor, is not utilized in existing microtrons. Instead, the microtrons are pulsed. The principle difficulty in a CW microtron is the large amount of rf power that would have to be developed and dissipated.

The University College group have a small microtron of a few Mev and a large one roughly six feet in diameter. The magnet for the latter consists of two poles each machined from a single large cast disk. Both microtrons perform quite satisfactorily and are in regular use for electron scattering experiments. In order to achieve vertical focusing, the accelerating cavity through which all orbits pass is located at the outer perimeter of the magnet. The magnetic field is so designed that the field along the particle orbits is uniform but with a negative radial gradient in the region where the orbit passes through the accelerating gap which is common to all orbits. This is achieved by arranging a hill just inside the accelerating gap where the magnetic field is higher than the uniform field through which the orbits pass. The lowest energy orbit circles around the foot of this hill.

Higher energy orbits circle farther out and experience a magnetic field gradient which is alternately negative and zero. Thus the orbits in the microtron may be regarded as subject to alternating gradient focusing with one sector per revolution.