The Physics Experiments of Robert Wichard Pohl (1884–1976)

For decades, Robert Wichard Pohl taught his famous lectures of introductory physics in the old lecture hall of the Physics Institute at Goettingen University. These lectures became the foundation for three volumes entitled „Introduction into Physics". Now, using Professor Pohl`s original instruments in the same lecture hall in which he taught, this set of videos captures his extraordinary ingenuity and once more brings to life Pohl`s great experimental skills.

Moments of inertia

Video title:	Moments of inertia
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Abstract:	The moment of inertia of a body is determined by its mass and its distribution relative to the axis of rotation. An experimenter assumes different positions on the stool which has been converted to a torsional oscillator, and its period of oscillation is determined. From this measurement the moment of inertia can be obtained, and is found to differ by almost an order of magnitude for different positions.
Source:	Pohls Einführung in die Physik - Mechanik, Akustik und Wärmelehre. Lüders, Klaus; Pohl, Robert Otto (Hrsg.) 19. Aufl., 2005, Springer Berlin Heidelberg New York; p. 70
Key words:	Mechanics, torsional motion, torque constant, torsional oscillation, moment of inertia

Goal of the experiment:
The moment of inertia of a body is determined by its mass and its distribution relative to the axis of rotation.

Experimental setup:
By adding a helical spring to a rotating stool with a vertical axis, it has been converted to a torsional oscillator. With an experimenter on the stool, its period of oscillation is determined with a stop watch. From this measurement and the known torque constant of the spring, the moment of inertia can be obtained.

Experiment:
The experimenter assumes three different positions on the stool, with three different distributions of his mass. The oscillatory periods are found to differ by as much as a factor of $18/5.5$ (~ 3. It follows that the moments of inertia differ by a factor of 9.

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