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.

Smoke rings

Video title: Smoke rings

Signature: C 14856

Series title: The Physics Experiments of Robert Wichard Pohl (1884-1976)

Abstract: Vortex rings are a remarkably stable form of moving gas. They are being made visible with cigarette smoke. They are shown to travel rapidly over many meters, and can even extinguish a candle.

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. 165

Key words: Mechanics, flow of gases, turbulence, vortex rings

Goal of the experiment: To demonstrate the existence of vortex rings in air, and their highly stable motion with high speed.

Experimental setup: A drum with a tightly pulled drum head has a circular hole in its bottom. It is positioned with its axis horizontal, aimed towards a lit candle. The air inside is filled with cigarette smoke, and the drum head can be tapped vigorously.

Experiment: When the drum head is tapped, turbulence at the hole leads to the formation of vortex rings which can be seen since they carry some of the smoke along. These rings travel rapidly on a straight line. By tapping the drum head in the right spot, the vortex rings can be made to travel towards the candle and may even extinguish it.

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Production and Distribution: IWF Wissen und Medien gGmbH, http://www.iwf.de, © IWF Goettingen 2006

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KNOWLEDGE AND MEDIA