

# SCIENCE

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## ON ACOUSTIC PRESSURE AND ACOUSTIC DILATATION

<i>On Acoustic Pressure and Acoustic Dilatation:</i>	
PROFESSOR CARL BARUS.....	489
<i>American Association for the Advancement of Science:—</i>	
<i>Duty on Scientific Apparatus for Educational Institutions.....</i>	494
<i>Scientific Events:—</i>	
SCIENCE and the Printers' Strike; The British Institute of Physics; The Boston Meeting of the American Medical Association; Mme. Curie's Visit to the United States .....	495
Scientific Notes and News.....	498
University and Educational News.....	499
<i>Discussion and Correspondence:—</i>	
Primitive Notions of Light: DR. IRWIN G. PRIEST. A Section of the American Association on the History of Science: PROFESSOR LOUIS C. KARPINSKI.....	499
<i>Scientific Books:—</i>	
Jellicoe on The Crisis of the Naval War: PROFESSOR ALEXANDER MCADIE. Stevens on Diseases of Economic Plants; DR. MEL T. COOK .....	501
<i>Special Articles:—</i>	
The Y-chromosome in Mammals: DR. THEOPHILUS S. PAINTER.....	503
The Rochester Meeting of the American Chemical Society: DR. CHARLES L. PARSONS..	504

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1. *Introductory. Apparatus.*—On a number of occasions, heretofore<sup>1</sup> I have endeavored to use the interferometer for the measurement of Mayer and Dvorak's phenomenon: but though the experiments seemed to be well designed and were made with care, they invariably resulted in failures. The present method, however, has been successful and led to a variety of results.

The apparatus is shown in Fig. 1, where  $B$  is a mercury manometer described elsewhere, the displacements being read off by the component rays  $LL'$  of the vertical interferometer. The mercury of the U-tube is shown at  $m n m'$ , above which are the glass plates  $g, g'$ , the former being hermetically sealed, the latter loose, so that the air has free access. The closed air chamber  $R$  above  $m$ , receives the air waves from the plate of the telephone  $T$  by means of the quill tubes  $t$  hermetically sealed into the mouthpiece of the telephone, and  $t'$  sealed into the manometer. Finally  $t''$  is a branch tube ending in a small stopcock  $C$  or similar device at one end, while the other communicates with  $tt'$ . Flexible rubber tube connectors may be used at pleasure, so long as the space bounded by the outer face of the telephone plate, the mercury surface  $m$  and the stopcock  $C$  is free from leaks.

The cock  $C$  will eventually be replaced by the glass tubes  $c$  and  $c'$  (enlarged) perforated with minute orifices at  $O$  at one end and open at the other.

The telephone is energized by two storage cells and a small inductor with a mercury or

<sup>1</sup> Carnegie Publ., No. 149, part III., pp. 206–08, Washington, 1914, and subsequently. The phenomenon has been studied by Rayleigh, Kolacek, Lebedew, Wien, Geigel and others. As to hydrodynamic forces in pulsating media, the researches of Bjerknes and W. König should be mentioned.