

VACANCIES IN THE GRADE OF ASSISTANT
CIVIL ENGINEER, U. S. NAVY

APPLICATIONS are being received at the Bureau of Yards and Docks, Navy Department, Washington, D. C., to fill 30 vacancies, more or less, in the commissioned grade of assistant civil engineer, U. S. Navy, with the rank of lieutenant (junior grade). The pay and allowances at entrance are approximately \$3,200 per annum, with increases up to \$9,000, depending upon length of service and promotions.

The candidate must be an American citizen, between the ages of 21 and 34 years on August 1, 1920; must have received a degree in engineering from a college or university of recognized standing; must have had not less than 12 months' practical professional experience since graduation, and must be of good moral character and repute.

The preliminary examination to determine general fitness will be based on papers submitted by the candidates, reaching the Board on or before August 23, 1920, covering college record, testimonials, references and professional experience. The candidate is not required to report in person for the preliminary examination. Physical examination by a board of medical examiners will be made of those candidates who qualify in the preliminary examination.

Those who qualify in the preliminary and physical examinations will take the final oral and written examinations to be held in Washington, D. C., as soon as possible after the preliminary examination papers have been passed on by the Board.

Officers of the Corps of Civil Engineers are detailed principally to the various navy yards and naval stations to supervise the work under the Bureau of Yards and Docks, Navy Department, Washington, D. C., consisting of the design and construction of all the public works of the naval establishment on shore as well as the maintenance and repair of existing structures. The work is exceptionally varied and offers an attractive field for able and ambitious young engineers. C. W. PARKS,

Chief of Bureau

ARISTOTLE AND GALILEO ON FALL-
ING BODIES

A DRAMATIC event in the history of physics is Galileo's dropping a one pound shot and a hundred pound shot together from the leaning tower of Pisa, to disprove Aristotle's law of falling bodies. In 1913 Professor H. H. Turner of Oxford, in a lecture at the Royal Institution, quoted Galileo's version of Aristotle's law:

Aristotle said that a weight of ten pounds, for example, fell ten times as fast as a weight of one pound.¹

To this J. H. Hardcastle replied,² "Aristotle never said this at all"; he refers any one who "wishes to find out for himself" to Aristotle's "Physica," Book IV., cap. 8. He does not quote from Aristotle, but quotes from Thomas Aquinas's commentary on the passage in Aristotle to which this reference points. Accepting Hardcastle's statement, G. Greenhill, William Ramsay and Oliver Lodge arrive at the conclusion³ that Aristotle has been misunderstood. Greenhill interprets Aristotle as teaching "that the terminal velocity of a body in a medium is proportional to the weight," a law "justified by Newton in his experiments in St. Paul's"⁴ and exemplified in the motion of "a raindrop or hailstone falling vertically in the air, or of a smoke particle up the chimney"; Galileo discussed an altogether different question, viz., "the start of such a body from rest." Ramsay refers to Ostwald as pointing out that "Aristotle was much more impressed with the retarding effect on the velocity of the mass of the medium through which the falling mass fell, than with the laws of 'free fall.'" Lodge emphasizes "the fact that 'terminal velocity' is the best instance of Newton's first law of motion in actual operation."

¹ Galileo, "Dialogues concerning two New Sciences" (Ed. Crew and De Salvio), New York, 1914, p. 62.

² *Nature* [London], Vol. 92, 1914, p. 584.

³ *Nature*, Vol. 92, pp. 584, 585, 606.

⁴ "Principia," Book II., Prop. 40.