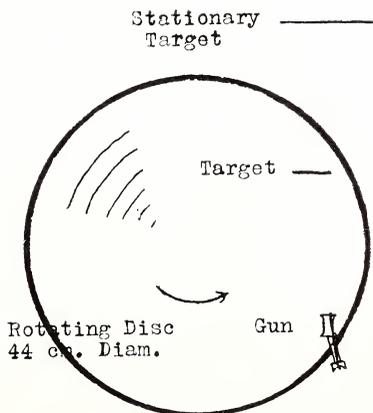


One of the electrodes in an ordinary discharge tube is in the form of a metallic cylinder (an aluminum tube about 2 cm. in diameter and 4 cm. long). Around this at equal intervals is placed single turns of, say, No. 20 nickel wire. The tube is now evacuated, primed with helium to make the cathode rays the more visible, and sealed off at a pressure giving a Crookes dark space of about 2 cm. and the cathode rays extending to the walls of the discharge tube. If now a discharge is passed through the tube with this electrode cathode the effect of the normality of the rays is at once visible. The rays fill the space out from the cylindrical cathode over its entire length, *except* where the single turns of wire are located. Each wire casts a shadow, yet the wire itself is a conductor! The explanation, obviously, is that the rays are radiated from the wire *perpendicular to its surface*.

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A ROTATOR ACCESSORY FOR SHOWING BY ANALOGY THE
APPARENT DEFLECTION OF A PROJECTILE DUE
TO THE ROTATION OF THE EARTH
ON ITS AXIS

The following described rotator accessory may be used to demonstrate the fact that a projectile fired, for example, toward the east in the northern hemisphere seems to veer to the right. A small "bean shooter" made out of a spool and a wooden plunger was fastened on a rotator disc having a diameter of about 44 centimeters. The plunger of the gun was driven by a rubber band fitted to it. The gun was about 3 centimeters long. At a distance of 25 centimeters from the gun and at right angles to its bore a metal target was fixed in position on the rotator disc. Just back of this target a second target was mounted on a supporting stand. The target on the rotating disc was so placed that when the disc was stationary the bullet would just hit the outer edge of it. However, when the disc was rotated one revolu-



tion in two seconds, the bullet fired when its bore was at right angles to the plane of the stationary target would miss the target on the disc but would hit the stationary target. Thus while the bullet traveled from the muzzle of the gun to the rotating target, the latter moved to the left enough to cause the bullet to miss it and hit the stationary target. A coating of wax placed on the surfaces of the targets enables the observer to locate the position of the impact of the bullet. The accompanying diagram shows the arrangement of parts.

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THE FORMATION OF NODES AND LOOPS ON A WEIGHTED
CORD BY MEANS OF A ROTATOR

The apparatus used in performing this simple experiment was as follows: A "chalk line" cord about two and one-half feet in length weighted at one end with an hundred gram mass-hanger had its other end clamped in the chuck of a rotator, the rotator shaft of which rotated about a vertical axis. By varying the speed of the rotator definite speeds were found at which the cord was made to break into one, two, three, etc., clearly defined loops having distinct nodes. The steadiness of these loops and nodes depended upon the steadiness and smoothness with which the rotator ran. Care was taken to keep the mass-hanger rotating about an axis along its stem rather than about some point in its stem as was its tendency to do. Perhaps less twisting of the cord would take place if a heavy braided cord like a heavy fish-line were used instead of a twisted cord. The accompanying diagram shows the arrangement of the apparatus.

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