AN OPERANT WATER-FEEDER FOR RATS

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The feeder device described represents an inexpensive, simple and reliable method of presenting a small quantity of water as a reinforcer. For our purposes, commercially available water feeders were too expensive. The literature suggested possible delivery mechanisms but these were either too complex in operation or required special fabrication and milling. The present device, shown in Fig. 1, has few moving parts and can be built with a few basic shop tools.

Water reward is presented by displacing water from a reservoir to a receptacle for the subject. Water is displaced by dropping a ballbearing into the closed water reservoir. A long

tube (glass or polyethylene), holding 9/32 in. brass ballbearings, serves as the magazine. A plastic feeder-bar located beneath the magazine will accept one ballbearing when the feeder-bar is in the rest position. A solenoid (Guardian Electric, type No. 4, 110 v, continuous duty) is attached to the feeder bar. Operating the solenoid retracts the feeder-bar and the ballbearings will drop through a hole into the 250 ml Erlenmeyer flask. The spring-mounted feeder-bar then returns to the rest position and accepts another ballbearing. Since the flask is filled to capacity the water displaced by the ballbearing is ejected through the flask spout into the water receptacle. The time interval between lever press and water delivery is 1.2 sec.

The magazine accepts approximately 95 ballbearings of the 9/32 in. size. Ballbearings of this size yield 0.5 ml of water. For different volumes of water, ballbearings ranging from 1/4 in. to 11/32 in. can be loaded in the magazine. These can be interchanged readily.

Servicing a feeder requires less than 3 min.

Building one water-feeder required approximately 13 hr of shop time. This could be reduced if a well-equipped shop were available. Four feeders were in operation 24 hr daily for four months without mechanical mishap. Cost of all components for one feeder is less than \$7.00. For the experimenter desiring accuracy of water delivery in terms of .01 ml other devices are available (Hulse, 1960). However, the present mechanism is simpler in construction than some other water-feeders (James, 1955; Lester, 1958).

REFERENCES

- Hulse, S. H. A precision liquid feeder system controlled by licking behavior. *J. exp. Anal. Behav.*, 1960, 3, 1-3.
 James, W. T. An operant liquid dropping apparatus for rats. *J. gen. Psychol.*, 1955, 53, 175-177.
 Lester, D. Water feeder. *J. exp. Anal. Behav.*, 1958, 1, 234.

Fig. 1. The water-feeder with the feeder-bar in the rest position after having just deposited a ballbearing into the flask.