OPERANT MANIPULANDUM FOR KITTENS

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The device pictured below has permitted us to record reasonably high response rates from kittens in a free-operant situation without shaping of any kind. Observation of kittens suggested that conventional lever arrangements depending on a downward press did not take advantage of more frequently occurring responses, such as swiping or pawing, which are prominent in play behavior. The device is made of simple materials easily obtained. The manipulandum is a durable plastic ball (Pee-Gee-Bee plastic golf ball) secured by a short hank of fishing line to a brass machine screw about 2 in. long (S) which slides longitudinally in a fixed plexiglass sleeve (T). An insulating collar (I), compression spring (C), copper washer (W), and nut

(N) are successively placed on the screw after it is pushed through the sleeve, which is rigidly centered in a $\frac{1}{2}$ -in. diameter tubular aluminum pedestal (P) passing through the wall of the test chamber and secured with a bracket (B). It is easy to adjust nut (N) so that the copper washer is held just off the rim of the pedestal tube by the spring and the ball is snugly located against the other end, inside the test chamber. Any displacement of the ball (except directly into the wall) will cause the copper washer to come in contact with the rim. This contact is utilized for electrical switching of conventional low inductance relays, *etc.* Approximate settings of nut and spring which have worked well are such that a force of about 50 g acting through a dis-

tance of about .5 cm records a contact. Adjustments can be made easily from outside the test chamber.

This arrangement has proved useful in studies of response-produced stimulus change, in which the use of primary rewards to establish baseline response rates is undesirable. It would probably be efficient and convenient in more conventional operant situations. Responding is readily brought under experimental control as judged by data ob-

tained utilizing the relatively weak reinforcement of light onset. With two manipulanda available in a small test chamber, combined operant-level responding in a group of 26 eight-week-old kittens has averaged from .6 to 73 responses in a 30 min session (mean 26.4). Rates around 200 in 30 min have been observed under continuous reinforcement schedules. Under these conditions of moderate duty the devices have proved reliable and durable.