A LIGHT-PROOF CAGE FOR THE LABORATORY RAT¹

FRIEDA B. LIBAW²

THE GALTON INSTITUTE

An experimental cage has been designed which permits feeding, watering and cleaning rats in complete darkness or during specific visual stimulation.

As evidence that the cage is light-proof when closed with an opaque panel, a strip

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of film exposed in the box for 30 min—during which the operations necessary for adding food, drinking water and cleaning were carried on—showed no fogging. The cage's dimensions and construction are shown in Fig. 1.

Living Space

The living quarters consist of a ½-in. wire mesh cage, 7 by 15 by 6 in. suspended within

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Fig. 1. Construction of the Light-Proof Cage. (Drawing by C. T. Thomas)

the wooden, light-proof outer box. A 1½-in. space separating the inner cage from the outer box, except at the front end, prevents gnawing. All wooden joints are calked and the entire apparatus is coated inside and out with a non-toxic, black, matte paint.

Ventilation, Feeding and Watering

Ventilation ducts permit the passage of air while preventing the entrance of light. Detail A on Fig. 1 shows the construction of the light trap. Air circulation is maximized by having one duct built toward the bottom of one side and toward the top on the other side.

Food is supplied through a tubular food reservoir with an opening at the top of the cage. Food placed in the tube's orifice is fed by gravity into the tilted, metal food trough. The tilt of the trough helps to keep it continuously supplied and also serves as a light trap. Its top is covered with ½-in. wire mesh to prevent excessive food spillage. The food-level indicator also serves as a handle by which the piston may be removed to add food to the reservoir.

A metal drinking tube through the front wall is connected by a black rubber tube to a bottle held by a spring clip. A clamp placed on the tubing during removal of the water bottle prevents the admission of light when renewing water supplies.

The mesh flooring of the inner cage permits waste food, feces and urine to drop into the drawer-like metal excrement tray. Before the excrement tray is removed for cleaning, a

light shield is inserted into a narrow slit which is lined with black felt stripping and shielded by an overhanging metal strip. The shield slips under the mesh flooring so that its insertion does not injure the animals. The light shield is withdrawn only after the tray is properly re-positioned.

Visual Stimulation

Complete darkness may be obtained by placing an opaque panel over the access door. Visual stimulation may be controlled mechanically through the use of back-lighted translucent stimulus panels or through the use of standard circuitry.

Conclusions

The primary advantage of the apparatus is that it permits the control of a rat's lifetime visual experience. This makes it possible to conduct a wide range of theoretically significant problems which are not testable merely by depriving animals of all visual encounter. Secondly there are the advantages of facilitating the conduct of routine laboratory maintenance and the saving of space when light deprivation is required.

REFERENCE

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