15196

An Improved Cage for Nitrogen Studies with Mice.

M. L. MacLachlan and L. A. Munro. (Introduced by R. G. Sinclair.)
From the Hendry-Connell Research Foundation, Kingston, Ontario.

During a study of nitrogen balance in mice on different diets, it was found that the experimental arrangements described in the literature for similar experiments were not entirely satisfactory. In such studies the total nitrogen ingested and excreted must be determined. Spillage of food, fouling of the food in the container, loss of nitrogen from excreta via ammonia and poor ventilation are some of the factors contributing to error in such determinations.

The cage described by Bittner[1] is not suitable for this investigation, particularly with the diets used in our experiments.

In our first experiments, beaker cages similar in principle to the glass containers described by White[2] were used. The feeding dishes were equipped with screw lids having a small orifice and were held in position by metal collars attached to the floor. In spite

[1] Bittner, J. J., Chapter 13, *Biology of the Laboratory Mouse*, G. O. Snell, editor, Blakiston Company.

[2] White, F. R., *Cancer Research*, 1945, **5**, 265.

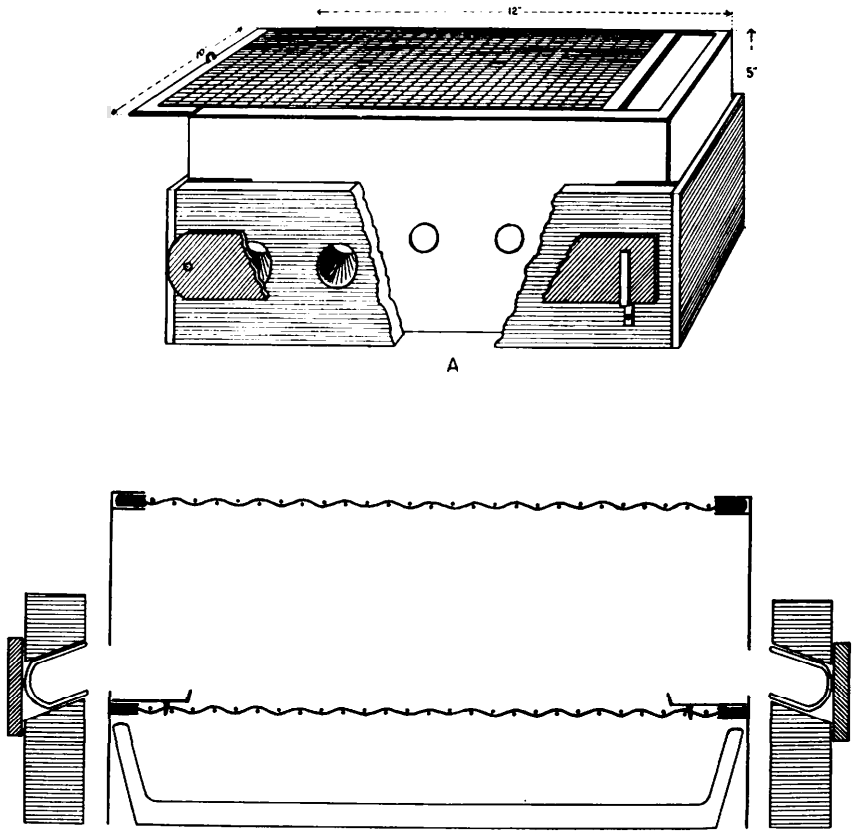

Fig. 1.
A. Exterior aspect of feeding cage.
B. Cross-section showing glass collecting tray.

of these precautions food spillage invariably occurred. Where nitrogen intake is determined from the weight of food eaten or where the caloric intake is being followed, spillage may be a large source of error. It was found that the individual cages used by White or by ourselves gave incomplete separation of the urine and feces. Difficulty was also experienced in cleaning the fine screens. Poor ventilation is evident when the feces are not removed daily. Loss in ammonia, however, was reduced by putting 25% sulphuric acid in the bottom of the mouse jar. It was observed that mice kept in individual cages ate less and did not maintain their weight as well as mice kept together in larger cages. Similar observations have been made by Brunschwig *et al.*[3]

To overcome the objections inherent in these methods of management of the mice, the metabolism chamber shown in Fig. 1 was devised. It was designed to accommodate 10 mice. It consists of a metal cage 12″ x 10″ x 5″ with a single floor of No. 3 gauge screen, 2 inches from the bottom. This fits over a glass tray. Five feeding holes, ⅝″ in diameter, are in each of 2 opposite walls. These holes are opposite recesses in a 1-inch board which forms part of an outer frame into which the metal cage fits, but which is offset ⅜″ from the metal wall. The recesses, ⅞″ in diameter, are depressed at an angle of 20° and are receptacles for the glass food cups. A wooden gate acts as the back-stop and enables the food cups to be inserted one at a time. The glass food cups are cut to fit the oblique hole so that there is a space of 3/16″ between the edge of the cup and the wall. Inside and touching the wall below each set of feeding holes is a movable metal tray kept in a position by 2 metal projections into the screen floor. A sliding screen cover furnishes adequate ventilation. Water bottles are inserted through the screen mesh. The whole assembly sits on a sheet of clean paper.

This experimental set-up solves the problem of spillage and fouling of the food. The mouse can reach the bottom of the feed cup but does not pull food into the cage. Any food pulled out of the cup drops between the metal wall and the wooden frame to the clean paper. Occasionally some food may stick to the head of the animal and subsequently be dislodged when the mouse again pokes its head into the feed hole. This material drops to the metal tray, and is recovered. Spillage was reduced to a minimum when the diet had the consistence of toothpaste.

Summary. A cage for the proper management of mice during nitrogen balance studies is described. The arrangement eliminates spillage of food, fouling by excreta, loss of ammonia, and other sources of error.

3 Brunschwig, A., and Rasmassen, R. A., *Cancer Research*, 1941, **1**, 371.

15197 P

Autoantibodies in Rheumatic Fever.*

PHILIP A. CAVELTI. (Introduced by K. F. Meyer.)

From the George Williams Hooper Foundation for Medical Research and the Division of Medicine of the University of California Medical School, San Francisco, California.

As reported previously[1,2,3] autoantibodies to kidney can be produced by immunization of animals with mixtures of group A streptococci and kidney of the same species. The streptococci thereby confer antigenicity on renal material which, as such, is nonantigenic in the homologous species. The autoantibodies to kidney thus formed react specifically with plain normal homologous kidney as demonstrated *in vitro* by the collodion par-

* This investigation was aided by grants from the Commonwealth Fund.

1 Cavelti, Philip A., and Cavelti, Else S., *Arch. Path.*, 1945, **39**, 148.

2 *Idem., Arch. Path.*, 1945, **40**, 158.

3 *Idem., Arch. Path.*, 1945, **40**, 163.