Bennett, Jack and Ronald Ostrowski.
Northern Illinois University, DeKalb, Illinois. An improved inexpensive plastic population cage.

Bennett (1956) devised an inexpensive population cage constructed from a polyethylene plastic container (10 x 14 x 10 cm) containing eight food vials. This cage overcame many population cage disadvantages but had numerous disadvantages including a tendency to pop open, and a very limited total capacity. Now we wish to report an improved population cage used successfully in population studies. The population cages were constructed from 34 x 26 x 9 cm, clear polystyrene containers (Sterling Products Co. Inc., 153 Thompson Ave., St. Paul, Minn., style #UB-200, 88¢ each) (see Fig. 1). Each cage contained thirty 25 x 95 mm, 8 dram, glass, shell vials with food, four side plugs for exchange of gases and a plugged hole at the top of the cage for removal of flies.

The holes in the polystyrene containers were produced with a hot, sharpened, metal pipe (32mm in diameter). The pipe was heated over a gas flame and then used to melt several holes in the container. Polyurethane foam sleeves were used to fit the shell vials to the holes, (these were punched from 5 x 3.8 cm plugs) (Scientific Products, Evanston, Ill. #T-1387 dispo-plugs for 35-45 mm. $10.39/200) using the punch described by Bennett and Mittler DIS 41: 194.

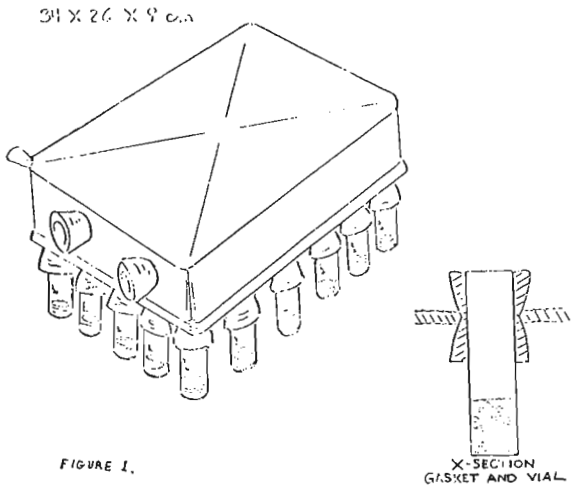

FIGURE 1.

The advantageous features of this general design include:

1. The polyurethane foam gaskets are quite flexible while maintaining their original shape. This allows the food vials to be held firmly in place. The flexibility and porous qualities of these gaskets also allow the exchange of gases.
2. The sturdy structure of the polystyrene containers allows many vials (30 in this design) to be introduced into this cage without the cage bending, buckling, or generally losing shape.
3. With 2 of the 30 vials changed every day, no one vial remains in the cage longer than 15 days. This procedure keeps mite contamination at a minimum.
4. Worked-out vials can be replaced with fresh food vials quickly, without loss of flies or contamination from the laboratory atmosphere.
5. Large numbers of flies can be maintained minimizing influence of genetic drift. Typical adult populations were around 1,000-3,000 at 25° C using the medium described by Mittler and Bennett (1962, DIS 36: 131).
6. Whole cage counts can be made quite efficiently.

Anesthetization of the cage populations was accomplished in two steps. First, the individual cages were inverted and flushed with nitrogen gas until all the flies fell to the dry surface (approximately 1 minute). Flies were then shaken into small 473 ml (1 pint milk bottle) containers via the 7 mm hole at the top corner of the cage. Next, the flies were etherized in small groups to enable easy, accurate counting. After counting, all live flies were placed in fresh food vials and reintroduced to the cage.

7. The polyurethane plugs and gaskets at the sides of the cage allow gaseous exchange and egg sampling without disturbance to the population's normal living habits.
8. These cages require a minimum amount of space for storage and can be stacked in use.
9. The standard culture vial is used in the cage, avoiding additional glassware styles.