Hersh, A. H. Incubators. A multiple temperature incubator, total length about 15 feet including an icebox at one end and at the other an electrically heated water tank fitted with thermoregulator. A long copper trough insulated with glass wool serves for heat conduction. This apparatus is slightly modified from model #3 described by C. B. Williams and T. W. Kirkpatrick (1924, Technical and Scientific bulletin # 38, Ministry of Agriculture, The Government Press, Cairo, Egypt). The thick copper trough is deep enough to accommodate 8 oz. bottles. When the hot tank is kept at about 40° C, a temperature gradient over the interval 10° to 35° can be maintained with sufficient constancy for any investigation which does not require any extensive amount of space at any single temperature.

Spencer, W. P. Incubators In culturing many species of Drosophila optimum temperature conditions are extremely important and even in the case of easily cultured species such as melanogaster, virilis, or funebris much of the trouble with mold, mites, and infertility would be obviated by starting cultures at the optimum temperature.

The incubators described below are not presumed to take the place of the accurate and elaborate temperature control systems developed by Bridges and Plunkett. They do, however, supply at very little expense a means of rearing large numbers of stock and experimental cultures at a temperature fluctuating not more than a degree centigrade.

A casket pack (rough box) may be secured from any funeral director for from 25 to 50 cents. This consists of a strong light wooden framework to which is tacked three ply 1/8 inch wood veneer panels. These boxes vary in size; one of average size we are using has the following inside measurements: length 7' 4", width 2' 6", depth 2' 1". The lid is hinged to the box with three or four hinges, and hooks or other fasteners provided to hold this door shut. As the wood veneer is tacked on the inside of the framework, panels of cellotex or other composition insulating material are cut of a size to fit snugly into the framework on the outside. These are held in place by one or two light lath tacked over them and to the framework. The box is set on end and may be put on castors. The first shelf is placed at least two feet above the bottom. These shelves may be made of one-half inch wire mesh tacked on wooden frames which rest on supports nailed to the framework. Each shelf, for an incubator of the above dimensions, has a capacity of 100 half pint milk bottles. Five shelves can easily be used with ample room for removing culture bottles from the back of the shelf without disturbing those in front. The heating unit consists of electric light bulbs placed in or near the bottom of the incubator. A thermostat is placed on the back wall about middle of the incubator. One light bulb of 60 watts is capable of keeping this incubator with approximately 40 cubic feet of air space about three degrees C above the room temperature. We use a 60-watt bulb in series with a bi-metallic thermostat and other

bulbs which may be turned on, but which are not in series with the thermostat. By carrying a light load on the thermostat danger of sparking and sticking is lessened; then if this does occur the temperature will not go so high that serious damage is done. It is of course desirable to use a room for fly culture where day and night temperature fluctuate to a minimum. A cellotex shelf is provided which may be fitted in at any level to cut down the size of the incubator when the full capacity is not needed. Such a 500 bottle incubator gives surprisingly little fluctuation in temperature from shelf to shelf corners. This may be due to the long distance from the heating units to the first shelf. A galvanized pan three inches deep covers the bottom of the incubator and is kept full of water. The incubator, when empty can easily be moved by one person. The total cost is less than $10.00. Such an incubator has been in use in our laboratory for two years, with no appreciable wear.

Stern, Curt Incubators. Two-shelf incubators with toluene mercury thermoregulator and Aminco relays as described by Bridges, 1932, Am.Nat. pg. 258-265. In order to keep temperature constant at or below outside temperatures (no cool rooms available!) we have installed cooling devices above the heating units at the height of the middle shelf: (a) copper tubing, through which running water circulates constantly is sufficient for keeping the temperature within a few degrees below the outside temperature, (b) for lower temperatures a grid connected with a refrigerator unit is being used.