A MODIFIED PRESSURE CHAMBER FOR USE IN A SMALL LABORATORY

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In working on the problem of oxygen lack, many difficulties are encountered such as failure to obtain a pressure chamber of suitable size, difficulty in recording rate of "ascent" and the degree of rarefaction of the air, etc. We thought that our arrangement of a pressure chamber would be of interest to other investigators.

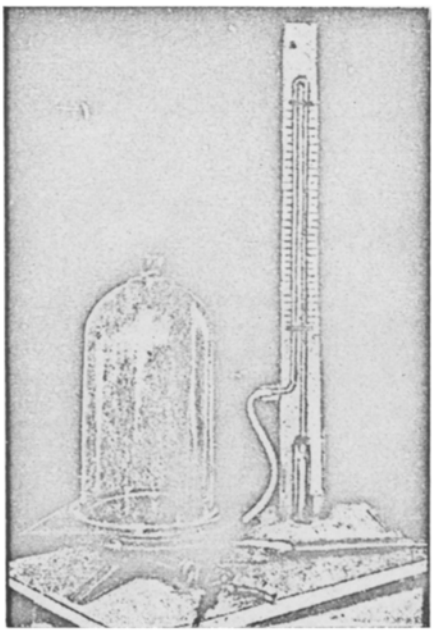

Fig. 1. I. B. Friedland's pressure chamber.

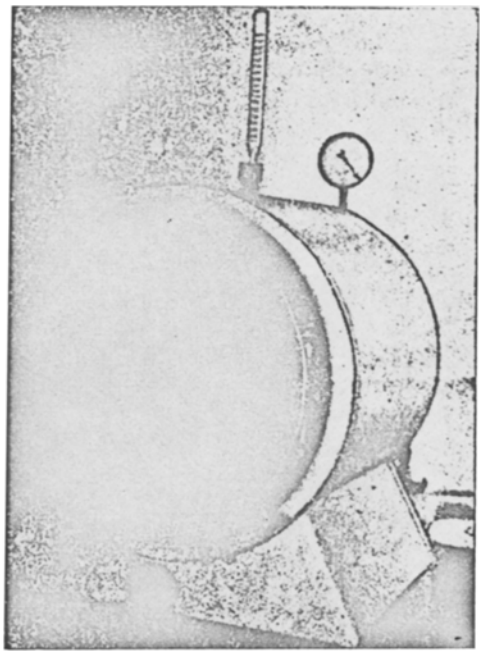

Fig. 2. Vacuum drying cupboard type VSh-0035M.

At first we used a pressure chamber of the type proposed by I. B. Friedland (Fig. 1). Upon a cast iron base there is mounted a 45 cm diameter disk in which there are holes for the supply and withdrawal of air; a rubber ring is placed on the disk and a glass bell jar with a broad lower edge placed upon it. Air is removed by means of a suction pump. Fresh air is continuously supplied to the chamber. The pressure is recorded by a mercury manometer.

This chamber was not entirely adequate for our purposes, as only one animal of average size such as a cat or rabbit could be placed in it. We therefore constructed a special pressure chamber. The basis of this was the vacuum drying cabinet, type VSh-0035M (diameter – 364 mm, length – 400 mm; Fig. 2).

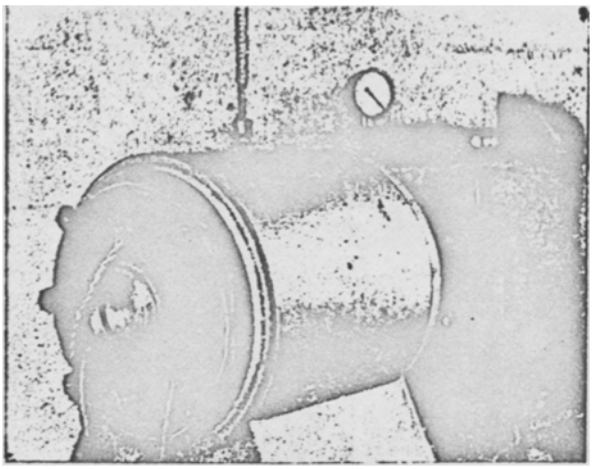

Fig. 3. Vacuum drying cupboard modified for use as pressure chamber.

Many alterations to this cabinet were effected (Fig. 3). A piece of transparent Stalinite type glass 7 mm thick and 150 mm diameter interleaved with a layer of plastic was mounted hermetically on the outside of the middle of the roof. A needle valve, previously in the middle of the roof was moved down to the bottom. Leads to a 6 volt lamp for lighting the chamber were taken in through the top of the roof.

For sucking the air out of the chamber, we used a vacuum pump type VN-461 connected to the chamber through a glass oil trap. At all junctions in the system, vacuum type screw connections were provided. A constant flow of fresh air into the system was obtained through the needle valve.

Three pipes were fitted to the place previously occupied by the dial type vacuum meter, and they were connected to the following pieces of apparatus: a dial type vacuum meter, a membrane variometer, and an aneroid altimeter with two pointers.

The original vacuum meter indicated the pressure in mm of mercury. The two pointer aneroid altimeter indicated "height" in meters and kilometers. The membrane variometer gave a precise indication of the rate of rarefaction, and showed the rate of "rise" in meters per second.

After the predetermined height had been reached a "platform" was established, and the pressure was maintained at a constant level by equalizing the amount of air withdrawn to that entering. The animals could be observed during the experiment through an inspection window.

SUMMARY

A modification of a pressure chamber, convenient for work with rabbits, cats and guinea pigs was proposed. A vacuum drying cabinet of VSh-0035M type was used for the equipment of the pressure chamber. The rapidity and the degree of air rarefaction was registered in a chamber by 3 instruments: by a vacuum meter with a pointer, by a membrane variometer and an aneroid altimeter. A special inspection window permits observation of the behavior of laboratory animals.