

tion occurred around (c). In addition, however, both epidermal and dermal host chromatophores within a radius of a few millimeters from the grafts became maximally expanded and finally confluent. This local effect appeared within a week and remained localized. Infundibular fragments without hypophysis have produced it. If pituitary was included, the whole animal, in addition, darkened progressively.

A more detailed analysis, as well as the correlation of the results with those obtained in other forms and with different methods by other workers, is planned for some later date. In conclusion, the experiments indicate triple action on pigment formation by different portions of the diencephalic-hypophyseal complex in urodele amphibians: (1) stimulation of new pigment cell formation and melanin deposition (thalamic floor), (2) local chromatophore expansion (infundibulum), (3) local and diffuse chromatophore expansion (pituitary); (2) and (3) apparently being followed by increase in total melanin content.

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A Method for Obtaining Gas Samples of the Total Inspired Air.

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In testing the efficiency of equipment used for administering gases it is important to determine the percentage of the component gases of the total inspired air. A sample of gas may be drawn from the apparatus itself during inspiration at a point near the nose, or alveolar air determinations may be obtained.

Both of these methods have limitations. In a mixture of gases, a sample taken at the beginning or end of inspiration might not be a true index of the percentage of that gas in the total inspired air. An alveolar sample is not an accurate guide of the carbon dioxide concentration in the inspired air, since changes in the volume of ventilation tend to keep the alveolar carbon dioxide concentration constant. Rather wide discrepancies in CO₂ accumulation were found in the inspired air of masks recently tested when the alveolar air samples obtained failed to reveal the significant changes found.¹

¹ Barach, Alvan L., and Eckman, Morris, *J. Aviation Med.*, 1941, **12**, 39.

In order to obtain the total inspired air we have developed the following method. This consists of obtaining a sample of gas from the mask, equal in volume and equivalent in rate to a normal inspiration, during the time inspiration would normally be taking place. The samples are collected in a calibrated sampling bottle connected to a reservoir situated at a lower level. By controlling the volume and rate of flow of water from the sampling bottle to the reservoir, samples of gas equivalent to those which would normally be inspired may be obtained.

Description of Apparatus. A sampling bottle (D), calibrated in cc from the mouth down, and a reservoir bottle (E), each of 2 liters capacity are connected by a glass tube of one inch diameter. The bottles are mounted on a wood support frame (C), fitted with a bearing (H). The bearing slips over an axle secured to a large ringstand (F) by a clamp. With this bearing and axle arrangement the support frame may be tilted so that the sampling bottle may be brought above or below the reservoir bottle. A rod (G) fixed to the ringstand near the bottom of the support frame may be swung under the support frame to hold it in any position desired.

Connected to the sampling bottle by means of a rubber stopper is a rubber tube (B), of one-half inch inside diameter, fitted with a pinch clamp. A glass connecting tube (A) is attached to the open end of the rubber tube.

In calibrating the sampling bottle it is important to include the volume of the rubber tube.

Operation. Add about 3 liters of acidified water to the bottles. Tilt the support frame to lower the sampling bottle, open the pinch clamp on the rubber tube and allow all the gas in the bottle, the rubber tube and glass connecting tube to be expelled. Re-clamp the tube.

Raise the sampling bottle by tilting the support frame, until the top of the sampling bottle is well above the water level in the reservoir. The support frame should be fixed in this position by the rod provided for this purpose.

Insert the tip of the glass connecting tube into the mask, or other apparatus to be tested, at a point near the nose. Just as the subject is about to inspire he is told to hold his breath. The pinch clamp is opened long enough to permit a sample equal in volume to the tidal air to be drawn into the sampling bottle.

The size of the sample may be determined from the calibrations on the sampling bottle. By varying the inside diameter of the glass connecting tube or the pitch of the bottles, the speed of intake of

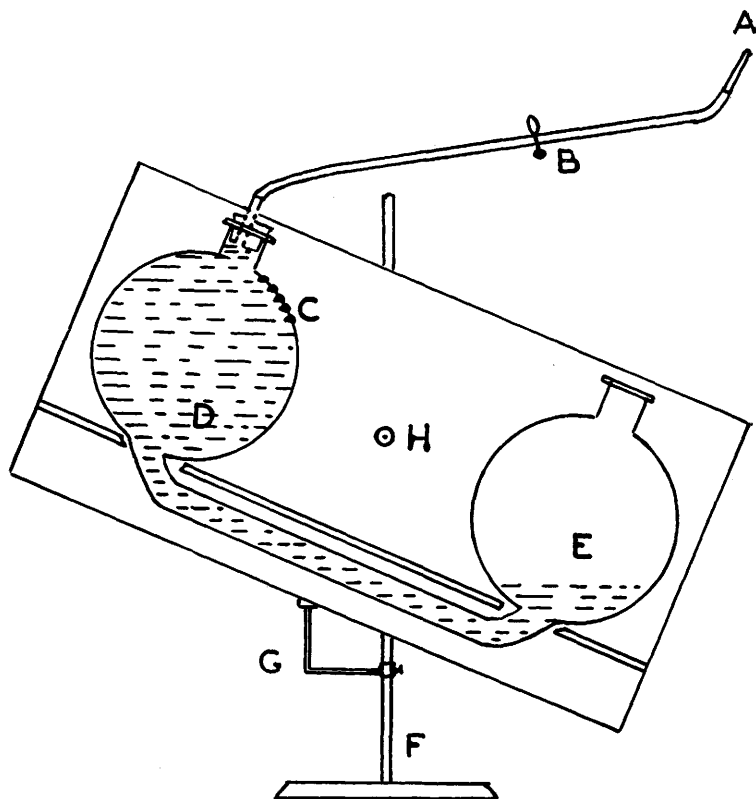


FIG. 1.

the sample may be made to equal the speed of inspiration of the subject.

Conclusions. A method for obtaining an accurate mixed sample of the total inspired air is described. Provision is made for control of the size of the sample and the rate of sampling so that they conform to the inspired air of the subject.

The CO_2 percentage of the inspired air in a mask is more reliably obtained through this method than through alveolar CO_2 samples, since the volume of ventilation tends to keep the CO_2 tension constant. Alveolar samples taken at low barometric pressures, such as 140 mm Hg, are compressed to such a small volume at sea level that analysis may be difficult. Such difficulty is not experienced when taking large inspired air samples for analysis.