to a surprising degree of exactness and the following numerical relations were established:

1. If a pair of sister leaves (of equal size) are isolated both will produce under equal conditions and in equal time approximately the same mass of shoots, although the number of shoots may differ considerably in the two sets of leaves.

2. If the mass of one of the two sets of sister leaves is diminished (by cutting out pieces of the leaves), the mass of shoots produced in the two sets is in proportion to the masses of the two sets of leaves.

3. It had been shown by previous experiments that if a piece of stem is attached to a leaf the growth of the notches of the leaf is retarded. It has been shown by the new experiments that the mass of shoots of leaves attached to a piece of stem is smaller when the mass of the stem is larger and that it also varies directly with the size of the leaf. These quantitative data furnish the basis for a chemical theory of regeneration.

79 (1257)

A new method of obtaining samples of the respiratory gases in animals. A demonstration.

By **A. L. MEYER.**

[*From the Department of Physiology and Pharmacology, Rockefeller Institute for Medical Research.*]

I wish to demonstrate a new method of obtaining a sample of air from the lungs, bronchi and trachea of the dog. Chloretone, dissolved in olive oil, is given intraperitoneally. The animal is tracheotomized and a T-shaped glass cannula is introduced. A Meltzer pleural cannula (new form) is placed in each pleural cavity. The intrathoracic negative pressure is then restored and the pleural spaces tested for air-tightness. It should be possible to maintain the negative pressure indefinitely. If any change occurs, it must be in the direction of an increase owing to the absorption of gases through the pleuræ.

Both pleural cannulæ are now connected with a source of air

pressure. A small-sized rubber bag is then attached to the horizontal portion of the tracheal cannula. The bag is thoroughly exhausted. The cocks of the pleural cannulæ are now opened. *At the end of an expiration*, the upright portion of the tracheal cannula is quickly clamped, the air pressure is turned on and the bag opened. A mercury valve is provided so that the desired pressure cannot be exceeded. The lungs collapse. Their contents are forced into the trachea and rubber bag. A portion of the air remains in the bronchi and trachea. The sample therefore approximates the *total air*.

It has been found that when no precaution is observed to maintain the body temperature, very uniform percentages of carbon dioxid may be obtained. Five experiments have been made thus far. In each experiment the carbon dioxid exhibited uniformity, either immediately or after a preliminary period of fluctuation. The periods of constancy ranged from one and a half to three and a half hours. In three experiments in each of which 8 determinations were made, the maximum deviation from the average was ± 3.0–3.5 per cent.; in one experiment, in which 7 determinations were made, the maximum deviation from the average was ± 2.4 per cent.; in another experiment, in which 5 determinations were made, the maximum minus deviation was 0.5 per cent. and the maximum plus deviation 1.4 per cent.

80 (1258)

On the compensation of the ocular and equilibrium disturbances which follow unilateral removal of the otic labyrinth.

By **A. L. PRINCE** (by invitation).

[*From the Physiological Laboratory, Yale Medical School.*]

It has been shown[1] that the disturbances of function which follow unilateral destruction of the otic labyrinth are of short duration in higher mammals, the torsion of the head being the only persistent symptom. In very young animals, the conditions

[1] Wilson and Pike, *Phil. Trans. Royal Society*, London, 1912, Series B, CCIII, p. 127.