substances for as long as six days, surviving ox arteries were chosen as the best material for the study of this other factor in the arterial wall, namely, tonus. These vessels were examined first cold and contractured, then warmed to body temperature, then stretched to relaxation by 100 millimeters internal pressure, then after the introduction of adrenalin, and finally of barium chloride, into the internal circulation. In each case a control tracing of the reaction of a strip of the vessel according to Meyer's method, carried under identical conditions and tested at the completion of each stage of the experiment, was made. The surviving character of the vessel was thus demonstrated.

Of 38 common carotids and 4 mesenterics from the ox, the following gave results free from obvious error:

Seven ox carotids.

	15° C.	37° C.	Stretched.	Adrenalin.	Barium chloride.
Maximum	68.5	22	9.5	10.5	28.5
Average	42.8	14.3	6.6	8.9	15.5
Minimum	25	8	4.5	7.5	9

Four ox mesenterics.

Maximum	52	9	5	8	55
Average	25.1	6.5	3.8	6.6	29.5
Minimum	10.5	4	2	6	18

These observations demonstrate very clearly the relation between tonus of the arterial wall and its resistance to compression. A definite opinion as to the possible maximum effect of tonus, and, therefore, the placing of a numerical value for this factor of error, is not possible as yet.

101 (511)

A simple device for regulating the administration of ether or chloroform, with either artificial or voluntary respiration.

By **A. O. SHAKLEE.**

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

In the course of a study by Dr. Meltzer and myself of the use of continuous insufflation in the treatment of various forms of fatal poisoning, the apparatus described below was devised to simplify the control of anesthetic and pressure of air entering the

lungs. By means of this device an animal may be kept in any desired state of anesthesia over a long period of time with little or no attention.

The apparatus consists of a three-necked Wolff-bottle or other convenient container for the anesthetic, so fitted with tubes (metal or glass) and stop-cocks that by turning slightly a single stop-cock any portion or all or none of the stream of air for respiration may be passed over the surface of the anesthetic, thus charging the air with any desired quantity of the anesthetic. The relative quantity of anesthetic in the inspired air may be read off on a convenient scale. The apparatus is also fitted with a manometer, and an escape stop-cock for regulating the pressure of the air entering the lungs. The cock regulating the quantity of air passing into the bottle is a three-way cock placed at the junction of a T-tube, the vertical limb of which passes through the stopper of a side neck of the bottle. The ports of the cock are so arranged that the one admitting the air is always wide open, and the port leading into the anesthetic container begins to open as the port leading directly to the lungs begins to close. Thus any portion or all of the air stream may be shunted into the anesthetic container, and on issuing at the farther opening it rejoins, by means of a T-tube, the stream passing directly to the lungs, charging it with the desired quantity of anesthetic. The manometer is introduced into the circuit on the side of the container nearest the lungs. It is provided with a direct reading scale, visible from either side. The stop-cock for regulating the pressure is placed on the side of the container nearest the air pump. The third neck of the container is fitted with a funnel tube for filling. It is also convenient to have a side tubulure near the bottom of the container, by means of which any water condensed in the container may be off. The whole apparatus is mounted on a compact frame.

Not only was the device found useful with artificial respiration, but a preliminary trial seemed to indicate that it would also prove serviceable in administering an anesthetic with voluntary respiration either with or without tracheotomy. If it is desired to administer the anesthetic without tracheotomy, it is only necessary to introduce a tube (a stomach tube answers very well) into the trachea and attach it to the bottle. The tube in this case should

be sufficiently large to fit the laryngeal opening closely so as to prevent aspiration, and also to cause enough of the inspired air to pass through the anesthetic container. If it is desired to reduce the amount of dead space, it may be done by placing a suitable exit valve in the tube near the mouth.

If it is desired to mix a gas with the air in varying proportions, it is only necessary to place a three-way cock of the kind described at the juncture of the gas stream with the air stream.

102 (512)

Hybridization in a mutating period in Drosophila.

By **T. H. MORGAN.**

[*From the Department of Zoölogy, Columbia University.*]

In the fourth generation of a pedigree stock selected for the absence of a black shield on the thorax, a few individuals appeared having dark specks on the sides of the thorax below the base of the wings. Thirty-two individuals with specks appeared to 167 without specks. Again from one set of the latter a new brood was obtained that gave 19 present to 286 absent, or 1 to 15. Isolated, the new type bred true. These were mass results, and might have been due to a few individuals in the culture transmitting the specks on the wings, while the majority of the individuals might not transmit this character. Isolated females, not virgins, gave the following proportions:

Absent.	Present.
18	2
24	0
31	0
24	0
31	6

Here the results might have been due to a single female pairing to more than one male before isolation. Therefore, virgin females and males were isolated in pairs from the same stock. The following records are typical results.

Absent.	Present.	Absent.	Present.	Absent.	Present.
37	15	49	14	20	1
3	1	31	5	7	1
21	0	91	0	33	1
23	0	69	0	12	8
63	16	21	18	46	7
49	0	23	1	38	0