the administration of small amounts of streptothricin. The drug is more effective parenterally than when given orally. However, preliminary experiments show that streptothricin by mouth greatly reduces the lactose fermenting bacteria of the intestinal tract. In this respect the drug is similar to certain sulfonamides and suggests, therefore, that streptothricin may be of value in bacillary dysentery and typhoid fever. The marked effect of streptothricin *in vitro* against gram-negative and gram-positive organisms, coupled with the fact that body fluids have no apparent inhibitory effect on the action of streptothricin, suggest that the crude drug might be of great value in infected wounds and burns.

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THE TIDAL AIR OF LABORATORY ANIMALS[1]

BECAUSE of the increasing need for information concerning the tidal air of laboratory animals we desire to present a general formula for such a determination on resting and fasting animals and to present the results of experimental tidal air determinations under conditions more nearly resembling those found during inhalation experiments with infectious nuclei.

In determining the tidal air by formula it must be assumed that animals use up the same proportion of oxygen from the air as man, *i.e.,* approximately 5 per cent. Thus, animals under basal conditions inspire 20 liters of air for each liter of oxygen consumed. The oxygen consumption in 24 hours in animals and man can be estimated from the basal heat production which for warm-blooded animals from rats to steers averages ($72\ W^{3/4}$) calories, where W is the body weight in kilograms.[2] Since one liter of oxygen consumed by fasting animals represents 4.7 kilocalories of heat, the basal rate of oxygen consumption amounts to $\frac{72}{4.7} W^{3/4} = 15.3\ W^{3/4}$ liters of oxygen per day, or $306\ W^{3/4}$ liters of air per day, or $\frac{306 \times 1000}{1440} W^{3/4} = 212\ W^{3/4}$ cc of air per minute.

To determine the tidal air of 27-day-old albino Swiss mice under conditions more nearly approaching those found during inhalation experiments in which the mice are not at a basal condition, respiration trials were made in an apparatus previously described by Kleiber.[3] Animals were taken from a large cage containing food and water, divided into 7 groups of 10 mice each, and then placed in the respiration cages. The temperature during the run was 30° C. The mean metabolic rate of the animals during the whole trial (3 hours) was 119 kilo-cal./day/$Kg^{3/4}$; for the third hour only it was 97 kilo-cal./day/$Kg^{3/4}$. The mean weight per mouse at the end of the trial was 10.5 ± 0.25 gms. By the use of the formula, resting and fasting mice of 10.5 gms weight are calculated to have a tidal air of 7.0 cc per minute.

The tidal air of these animals as calculated from the metabolic rate was obviously decreasing from the start of the fast, as shown by the following figures.

Time in hours from start of fast	Mean tidal air per mouse per minute, in cc's
0.5	15.0 ± 0.8
1.0	11.7 ± 0.8
1.5	10.8 ± 0.7
2.0	10.5 ± 0.5
2.5	8.7 ± 0.3
3.0	9.3 ± 0.4

Some of the high rate in the initial half hour may be due to the effect of handling of the animals, but it is believed that the fasting was an important factor in the observed decrease. These data are comparable to the results of Loosli, Robertson and Puck[4] who used heavier, partially anesthetized animals and a different technique.

In some recently published experiments[5] we had occasion to determine the tidal air of a 3.5 kg *Macacus rhesus* monkey under intravenous pentabarbital anesthesia by means of a tracheal canula attached to a respirometer. Under deep anesthesia, when the respirations were shallow, three respirometer trials averaged 546 cc of air per minute. A resting and fasting monkey of the same weight would have a tidal air of 543 cc per minute as determined by the formula.

The basic heat formula is a useful tool for those interested in the biology of respiratory infections, since the tidal air of any laboratory animal can be quickly estimated if the weight is known. The data presented point out the need of having animals in a basal state in order to reduce the number of variables in inhalation experiments.

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[1] The opinions advanced in this paper are those of the writers and do not represent the official views of the Navy Department.
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