

This property, common at least to some war gases, could be utilized practically in gassed soldiers who are also wounded and require surgical intervention. It is very likely that they would need little if any anæsthetic. The gassed soldiers would thus be spared another danger and a valuable drug would not be needlessly expended.

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**Localized pulmonary edema in cats after the inhalation of a war gas  $(\text{CH}_3)_2\text{SO}_4$ .**

By **JOHN AUER.**

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In a number of cats which died or were killed 27–50 hours after gassing with  $(\text{CH}_3)_2\text{SO}_4$ , as described in the previous note, a localized pulmonary edema was observed on autopsy. The edema rarely involved the whole lung, but only a certain lobe or portions of a lobe showed a striking degree of pulmonary edema. The lobe involved was most frequently an upper or a middle lobe, but the lower lobes were by no means exempt. The best example of edema of a portion of a lobe was noted in the right middle lobe, where a section near the hilus showed extreme pulmonary edema, while the rest of the lobe was only moderately edematous. It was by no means infrequent to find one lobe fairly saturated with fluid while the rest of the entire lung tissue was practically free from fluid. Hemorrhages and pulmonary congestion, it should be noted, are not prominent features of the autopsy picture of the lungs after gassing with  $(\text{CH}_3)_2\text{SO}_4$ .

The causation of this localized pulmonary edema obviously must be due to some mechanism which affects the lung chiefly at the site involved; it cannot involve the whole lung to the same degree, for then the whole lung would have to be equally edematous. This locally acting mechanism is apparently the combination of a partial or complete stenosis of a bronchus or bronchiole with inspiratory dyspnea. These conditions are realized in cats gassed with dimethyl sulphate, for a marked inflammation of the respiratory passages with pseudo-diphtheritic membrane formation

occurs, and inspiratory dyspnea is always present to a greater or less degree.

Under these conditions therefore each alveolus which is in connection with a stenosed bronchus or bronchiole will act like a miniature dry cup during inspiration, because the pressure in these alveoli will decrease as the intrathoracic pressure decreases during each inspiration, for little or no air enters through the stenosed air passage. Therefore during each inspiration, which is slow, labored and prolonged in the gassed cat, the capillaries of the alveolar walls are subjected to an aspirating action which facilitates or initiates the passage of a transudate into the alveolar spaces. The production of this transudate is probably also aided by a local damage of the alveolar epithelium which the war gas produces.

It is thus seen that the fundamental conditions which apparently cause the local pulmonary edema of dimethyl sulphate are the same which are also operative in adrenalin pulmonary edema, as Gates and I have described elsewhere.<sup>1</sup>

Practically these observations may be of some value. In gassed soldiers all inspiratory dyspnea should be ameliorated as much as possible, by tracheotomy and artificial respiration if necessary. At another time I hope to report concerning the marked beneficial action of tracheotomy in fulminant cases of pulmonary edema produced by a different type of war gas.

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**On the electrical resistance and permeability of tumor tissues.**

(Preliminary communication.)

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Preliminary determinations of the electrical conductivity of primary breast carcinomas in mice (supplied by Mr. Millard C. Marsh) indicate that cancer tissues are more permeable to ions than are normal tissues and that the permeability bears a definite relation to the speed of growth, rapidly growing tumors exhibiting

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<sup>1</sup> *Jour. Exp. Med.*, 1917, XXVI, p. 215.