

Antioxidants, sponsored by the Macy Foundation, November, 1949) which described a beneficial effect exerted by aureomycin on growth and the prevention of dietary hepatic necrosis in rats. The assumption was made that aureomycin might act through the sup-

pression of the intestinal flora.

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An Improved Vertical Cylinder Oxygenator.* (17732)

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Prolonged interruption of blood flow to the heart and lungs followed by survival of the animals has been accomplished(1). The blood was oxygenated extracorporeally by blowing oxygen over a blood film upon the inner surface of a revolving vertical metal cylinder of 0.23 sq. meter surface area. A larger oxygenator of this type was described in detail(2). Recently, a still larger vertical cylinder, 79 cm in height, and 30 cm in internal diameter, has been constructed which differs from those previously described only in having a larger surface area, 0.71 sq. meter. It was thought that if the blood flow on the

smooth inner surface of the cylinder could be made turbulent, the capacity of the apparatus to introduce oxygen could be increased. The basic apparatus was therefore modified by closely adapting a 16-mesh, 26-gauge wire screen to the cylinder's entire inner surface.

Data showing the relative oxygenating efficiency with and without the screen are shown in Table I. These values for oxygen introduced by a single passage of blood over the oxygenating surface were chosen from a number of determinations for the similarity of their initial venous oxygen saturations.

The maximum amount of oxygen which

TABLE I.
Oxygenating Capacity—Screened and Smooth Surfaces.

Observation No.	Type of surface	O ₂ content vol. %		O ₂ capacity Vol. %	% saturation		Bld flow ml/min.	cc O ₂ added per 100 ml blood	Total cc O ₂ added per min.
		Venous	Arterial		Venous	Arterial			
1	Smooth	8.9	14.8	21.9	40.6	67.4	1080	5.8	63.1
2	Screen	8.7	21.9	21.8	40.1	100.9	856	13.2	113.3
3	Smooth	8.9	15.5	21.9	40.6	70.8	1080	6.6	71.3
4	Screen	8.7	21.4	21.8	40.1	98.5	1360	12.7	172.2
5	Smooth	9.2	16.5	18.9	48.2	87.0	510	7.3	37.0
6	Screen	8.2	14.8	17.2	47.7	86.2	8200	6.6	542.8
7	Smooth	10.8	15.1	18.4	58.7	82.1	1125	4.3	48.4
8	Screen	9.8	16.0	18.1	54.1	88.5	2000	6.2	124.0
9	Smooth	10.8	15.6	18.4	58.7	84.8	1000	4.8	48.0
10	Screen	9.8	14.9	18.1	54.1	82.3	7160	5.1	365.0
11	Smooth	11.1	14.7	18.4	60.3	79.8	1210	3.6	43.5
12	Screen	11.2	14.2	17.2	65.2	82.5	7160	3.0	215.0
13	Smooth	11.1	16.0	18.4	60.3	86.9	1000	4.9	49.0
14	Screen	11.2	14.7	17.2	65.2	85.5	7160	3.5	251.0

Single passage over smooth and screen oxygenating surfaces at comparable initial oxygen saturation levels. Venous blood is blood before passage and arterial after passage.

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1. Gibbon, J. H., Jr., *Surg., Gynec. and Obst.*, 1939, v69, 602.

2. Gibbon, J. H., Jr., and Kraul, Charles W., *J. of Lab. and Clin. Med.*, 1941, v26, 1803.

could be added to the blood with the original apparatus was 71.3 cc per minute, with a change in oxygen saturation from 40.6% to 70.8% (Observation No. 3, Table I), at a blood flow rate of 1080 ml per minute. Since the addition of a screen, a maximum of 543 cc of oxygen per minute has been added to the blood with an increase in saturation from 47.4% to 86.2% at a blood flow rate of 8,200

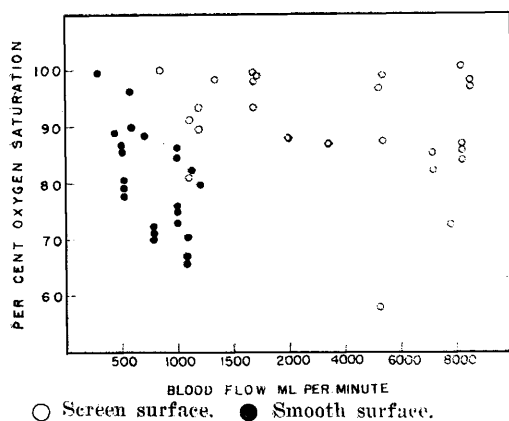


FIG. 1.

The % of oxygen saturation attained after single passage over screened and smooth oxygenating surfaces. Oxygen saturation before passage was approximately the same.

ml per minute. With nearly identical venous oxygen saturations, 48.2 and 47.7%, the attainment of closely similar arterial saturations, 87.0 and 86.2% respectively, occurred at a flow rate of 510 ml per minute without the screen and at 8,200 ml per minute with the screen (Observations No. 5 and 6, Table I).

Prior to the introduction of the screen, as the blood flow rate was progressively increased above 1 liter per minute, the blood oxygen saturation progressively decreased. With the screen however, the flow rate can be increased 8 times this amount, with satisfactory blood oxygenation. This remarkable difference between the 2 methods in the flow rate at which blood can be adequately saturated with oxygen is illustrated in Fig. 1.

The efficiency of the vertical revolving cylinder for the oxygenation of blood has been increased 700 to 1000% by the addition of a screen. This modified apparatus has been used to supplant the cardiorespiratory function of 2 dogs for 25 and 37 minutes, followed by survival to date, 3 and 5 months respectively, without organic damage.

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Failure of Cortisone or ACTH to Reduce Mortality in Irradiated Mice. (17733)

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The role of the adrenal cortex in the syndrome of irradiation illness is not well established(1). It seemed conceivable that cortisone (17-hydroxy-11-dehydrocorticosterone), or ACTH (adrenocorticotrophic hormone), might reduce mortality in acutely irradiated animals. A group of experiments was designed to test this possibility. Because of the great current interest in the effect of these compounds in a variety of disease states a report of their failure to protect mice given a

lethal amount of whole-body X-radiation appears to be appropriate.

Male mice of N.I.H. stock, kept on a diet of Purina chow, were caged 10 together from weaning to the time of irradiation when they were about 7 weeks old. They were then separated into comparable groups by litter and treated as shown in Fig. 1 and Table I. Ten mice were irradiated simultaneously, 5 each from the irradiated control and corresponding irradiated treated groups. Animals received 600 r whole-body radiation in the cortisone experiments, 500 r in the ACTH experiments,

1. Patt, H. M., Swift, M. N., Tyree, E. B., and John, E. S., *Am. J. Physiol.*, 1947, v150, 480.