

About 30 min. before the second and fourth experiments, the drug to be tested was introduced into the organ bath. The solutions of cortisone and of deoxycorticosterone acetate were prepared by diluting the proprietary preparations (Merck and Co., and Dale respectively) with 20 per cent alcohol, so that 1 ml. contained 500 and 100 μ gm. of the drug respectively. The volume of fluid in the bath was 55 ml. 1 ml. of 20 per cent alcohol had no effect on the twitch tension. The results show that the drugs did not influence the 'fatigue' process.

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Protective Action of Methylamine against X-Irradiation

Colter and Quastel¹ have shown that many amines (benzedrine, ephedrine, tyramine, methylamine, dimethylamine, ethanolamine and histamine) act as competitive anticholine oxidases, and protect choline oxidase against the inactivating effect of nitrogen mustard. It is well known that irradiation with X-rays has many effects in common with mustards. Accordingly, we tried the least toxic of these amines as protector in mice against a lethal dose of X-rays.

Mice of pure breed (*C* 57 black), four to six months old, were exposed to X-rays in groups of ten, in a cardboard box 10 cm. \times 10 cm. Physical constants: 250 kV., 18 mA., copper filter 0.25 mm., focal distance 50 cm., field 150 cm.², mean output 90 r./minute.

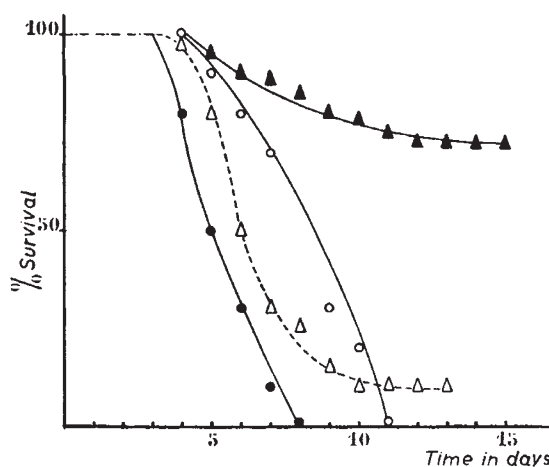
A first control group of mice received a single lethal dose of X-rays. A second group was injected intraperitoneally with methylamine (2 mgm.) neutralized in water solution; this dose is well tolerated. A third group was irradiated just as the controls, immediately after an intraperitoneal injection of 2 mgm. methylamine.

Forty controls received either 700 r. or 850 r. All the mice irradiated with 700 r. died between the fifth and the tenth day after irradiation; those which had received 850 r. died between the fourth and the eighth day.

In the group of fifty animals injected and irradiated with 700 r., the mortality (from the fifth to the twelfth day) was small; 73 per cent of the animals survived (see graph).

The mice injected with methylamine and irradiated with 850 r. died between the fourth and eleventh day, later generally than the controls; only 7 per cent survived. An injection of 2 mgm. or 2.5 mgm. of methylamine did not protect any animal against a dose of X-rays greater than 850 r. A dose of 2 mgm. methylamine injected 5 or 15 min. after the end of the irradiation (700 r.) shifted the mortality curve slightly to the right.

Thus, just as it has been shown with sodium cyanide and sodium azide^{2,3}, the action of methylamine is one of pure protection: the substance must



○, 700 r.; ▲, 2 mgm. methylamine and 700 r.; ●, 850 r.;
△, 2 mgm. methylamine and 850 r.

be present in the body during the irradiation; it becomes ineffective if given after irradiation.

Our observations offer a new fact in favour of the similarity of action of mustards and X-rays, which has been emphasized recently (for a review, see Bacq⁴).

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Protective Action of Ethyl Alcohol on Irradiated Mice

EARLIER unpublished work on the effects of ethyl alcohol on cells *in vitro* suggested to us the possibility that alcohol might modify the response to X-rays. With the present-day interest in agents which may modify the systemic effects of radiation, it was thought worth while to carry out experiments on the influence of alcohol on the lethal effects of whole-body irradiation in mice.

Pure-bred mice of the "A" strain six to eight weeks old were used. In a preliminary experiment, ethyl alcohol was diluted with saline to a concentration of 10 per cent by volume and the solution administered orally in two doses each of 1 ml., the first given 80 min., and the second 20 min., before irradiation. An equal number of control mice were treated similarly with saline. All the mice were then given 700 r. X-rays, a dose which is lethal to the "A" strain. The results are shown in Table 1.

Table 1

Treatment	Number dead	% Mortality
Saline followed by 700 r.	22/22	100
Alcohol followed by 700 r.	14/22	63