

The animals of Group A were housed in wire-bottomed cages and fed nothing but fresh carrots and tap water *ad libitum* for 10 days. The animals of Group B had a standard diet of Wayne's Kennel Krums, ground corn, and tap water *ad libitum* to which was added whole milk on the first and fifth experimental days and bread and lettuce on the third and eighth days.

On the eleventh day the animals were reweighed. The mean weight of Group A was 150.6 and that of Group B was 185.8.

The animals were placed in a decompression chamber which was illuminated to permit observation of their behavior. A detailed description of the tank is published elsewhere.³

The pressure was reduced to 225.6 mm Hg. (simulated altitude of 30,000 ft.) in 15 min and maintained at that level for 2 hr; after which it was returned to ground level in 45 min.

The temperature in the tank was as follows: 0-0.5 hr, 78°F; 0.5-1 hr, 80°F; 1-1.5 hr, 84°F; 1.5-2.0 hr, 86°F.

³ Andrews, A. H., Jr., Roth, L. W., and Ivy, A. C., *Quart. Bull. Northwestern University Medical School*, 1941, **15**, 46.

Results. Of the 107 carrot-fed rats 85 (79%) survived the exposure to high altitude whereas only 23 of the 107 control animals (21%) survived.

This striking difference in the survival of the treated and untreated groups confirms the result reported by Campbell. Our technic was not exactly that used by Campbell but the differences were obviously unimportant.

Experiments are now in progress which are designed to clarify the factors responsible for the protective effect of the carrot diet.

Summary. One hundred seven rats fed nothing but carrots for 10 days and 107 rats fed a stock diet were subjected to a simulated altitude of 30,000 ft for 2 hr. Eighty percent of the carrot-fed animals survived and only 20% of the controls survived. The animals on the carrot diet lost 1% of their body weight per day.

A diet of nothing but fresh carrots fed to rats for 10 days for some unknown reason affords marked protection against the lethal effects of exposure to a simulated altitude (decompression chamber) of 30,000 ft for 2 hr. This confirms the observations of J. A. Campbell.¹

13998 P

Cardiovascular Effect of Trichlorethylene.

G. H. MARQUARDT, J. F. MALLACH AND S. C. WERCH. (Introduced by F. T. Jung.)

From the Department of Medicine, Wesley Memorial Hospital, Chicago, Ill.

The neural depressing effect of trichlorethylene¹ can explain the alleviation of pain observed clinically, yet its value in the prevention and treatment of angina pectoris² may be also due to a cardiovascular effect. With this possibility in mind, a study of the effect of trichlorethylene on the cardiovascular system was undertaken.

Two reports dealing with the cardiovas-

cular effect of trichlorethylene are available. Both are from the same group of workers.^{3,4}

Lever experiments with the frog's heart were first carried out. Both the atrial and ventricular beat were recorded. The results from 6 experiments were alike. When 1 cc

³ Krantz, J. C., Carr, C. J., and Harne, W. J., *Proc. Soc. Exp. Biol. and Med.*, 1934, **32**, 334.

⁴ Krantz, J. C., Carr, C. J., Musser, R., and Harne, W. G., *J. Pharm. and Exp. Therap.*, 1935, **54**, 327.

¹ Rubenstein, H. S., Painter, E., and Harne, O. G., *J. Lab. and Clin. Med.*, 1939, **24**, 1238.

² Love, W. A., *Ann. Int. Med.*, 1937, **10**, 1187.

of the drug was dropped on the heart, the rate was slowed, and notching, observed in the control record, disappeared. When the heart is washed with physiologic saline the effects of trichlorethylene are removed. If more than 1 cc of the drug is used, the heart continues to slow and stops in about 5 min. Washing with physiologic saline does not then revive the heart.

Since the electrocardiogram is a better record of the condition of the myocardium and conducting mechanism of the heart, it was decided to use this method next. Rabbits (4) were used for these experiments, and trichlorethylene was administered by inhalation. When the control records were made the rabbits were in a basal-like state,⁵ and the drug was administered while they were still in this state. One rabbit was anesthetized every day for a week to study the effect of repeated anesthetizations. In the rabbits not previously treated with trichlorethylene, the drug produced arrhythmias and marked slowing. In the rabbit anesthetized each day for a week, T wave changes were noted on the electrocardiogram taken at the end of the period in addition to those

mentioned above.

Experiments were also carried out to determine the effect of trichlorethylene on human and frog capillaries. These were visualized with a capillary microscope and measured with a micrometer. The capillaries of the parietal peritoneum were visualized in the case of the frogs, whereas those of the nail bed of the ring finger of the left hand were used in the case of the human experiments. Capillary loops were observed in all instances in order to study both the arterial and venous divisions. Trichlorethylene was administered by inhalation. Tests were carried out on 6 different human subjects and on 6 different frogs. The results were alike. Constriction of the arterial side of the capillary loops occurred. The degree of constriction was approximately 50%.

All of the aforementioned experiments are being extended and further work is being done.

It was concluded that: (a) trichlorethylene causes vasoconstriction of the arterial division of capillary loops both in humans and frogs; (b) it does not produce permanent injury to the heart unless it is given in large quantities (frog) or repeatedly (rabbit).

⁵ Werch, S. C., *J. Lab. Clin. Med.*, 1941, **26**, 725.

13999 P

Trypanocidal Activity and Arsenic Content of Rat Blood Following Intravenous Administration of Mapharsen.

HAROLD N. WRIGHT AND LAWRENCE PETERS.*

From the Department of Pharmacology, University of Minnesota, Minneapolis, Minn.

Fractional dose therapy of rat trypanosomiasis has shown the trypanocidal action of mapharsen *in vivo* to be of relatively short

duration.¹ The brief trypanocidal activity of rabbit serum after administration of the related trivalent arsenical, reduced tryparamide, is also indicative of this fact.² On the contrary, arsenic has been found in the

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¹ Swinyard, A. E., Hirschfelder, A. D., and Wright, H. N., *J. Pharm. Exp. Therap.*, 1942, **75**, 367.

² Murgatroyd, F., Russel, H., and Yorke, W., *Ann. Trop. Med. Parasit.*, 1934, **28**, 227.