TABLE I. Mean Initial and Terminal Hemoglobin Concentrations.

Level of cobalt, mg/kg	Treatment, days	Treated Initial	Treated Terminal	Controls Initial	Controls Terminal
		g/100 ml ± S.E.			
2.5	80	13.6 ± .3	21.2 ± .2	14.2 ± .4	15.9 ± .1
5.0	86	13.5 ± .3	21.3 ± .2	14.2 ± .5	15.5 ± .2

Six rats in each group.

rificed by decapitation. Myoglobin analyses were performed on the combined gastrocnemius and soleus muscles from each leg by a modification of the method of Poel(9).

Results. The degree of polycythemia which had developed at termination of the experiment is shown in Table I. Erythrocyte counts and packed cell volumes paralleled hemoglobin values closely throughout the experiment. The data in Table II compare myoglobin concentration of the treated and control animals at time of sacrifice and show that the amount present was not altered by treatment with cobalt.

TABLE II. Effect of Cobalt on Myoglobin.

Level of cobalt, mg/kg	Treatment, days	Myoglobin Treated	Myoglobin Controls
		mg/g ± S.E.	
2.5	88	1.26 ± .03	1.25 ± .05
5.0	88	1.22 ± .03	1.17 ± .02

Six rats in each group.

Summary. Administration of cobalt to rats at a level sufficient to produce a marked polycythemia did not alter myoglobin concentration.

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A Double Yoke Harness for Prolonged Immobilization of Small Animals.* (23121)

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Prolonged immobilization of a small animal is often required either for collecting products of metabolism or for continuous administration of solutions, drugs, blood etc. For these purposes technics have been developed(1,2,3) by which the animal is almost completely immobilized. However, extensive and prolonged muscular inactivity may lead to death. Movement is obviously essential for the physiologic processes of the organism. Motivated by these considerations we have developed the following method for immobilization of continuously infused rats, using a metal harness consisting of a double yoke.

Methods. The double yoke is formed of 2 galvanized iron plates having a large eccentrically placed hole (Fig. 1), through which the rat's body is passed. A stainless steel wire (W, Fig. 1) is welded along the inner edge of the hole to blunt it. G-clamps (Cl, Fig. 1)

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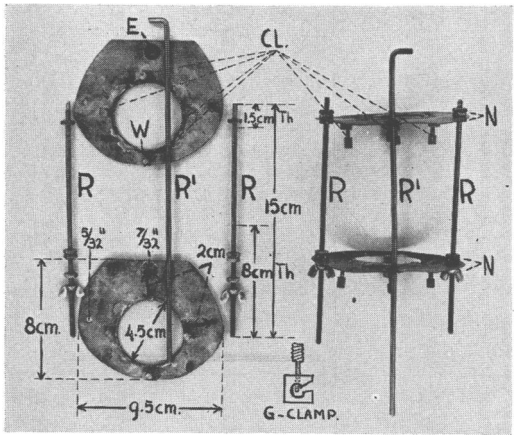

FIG. 1. Double-yoke harness. E = Eyelet for iron rod (R^1). CL = G-clamps. W = Steel wire. R = Brass rod. Th = Thread on brass rod. N = Nut.

with knurled screws are welded at the 4 quadrantal points of each metal plate, on the hind side. The yokes are interconnected by 2 threaded metal rods (R, Fig. 1) which permit adjustment of the distance between the 2 plates. Each of them passes through the side holes of the plates and is held in position by means of 3 nuts (N, Fig. 1). An eyelet (E, Fig. 1) at the top of each yoke is designed for the passage of a metal rod (R^1, Fig. 1 & 2) of the desired length, on which the yokes are suspended. They slide along this rod when the animal moves back and forth.

Technic. The rat (200-250 g body wt) is anesthetized and inch-wide strips of hair clipped around the body, one behind the forelegs and the other in front of the hind-legs. The skin is cleaned with 70% alcohol. The plates are fastened to the rat's body by a silver wire (#27) with which the skin is undersewn in large (¾") stitches. The parts of the stitches that overlay the skin are only ¼" long. They are fastened into the G-clamps (CL, Fig. 1) on the back of the plates by their knurled screws. The raised skin folds are arranged to almost close off the large holes of the yoke plates. The wire ends are then twisted and care is taken not to encircle too tightly the rat's thorax and abdomen, in order to avoid restriction of its respiratory movements. The iron rod (R^1, Fig. 1 & 2) is then passed through the eyelets (E, Fig. 1) and suspended on a rod consisting of 2 horizontal iron bars (B_1 & B_2 Fig. 2) which may hold several rats in position letting their feet touch the wired bottom (Fig. 2). The rats can walk backward and forward the few paces allowed by the yoke sliding on the iron rod, and can reach their food (F & Wa, Fig. 2) with ease. However the front yoke makes it impossible for the rat to turn its head and bite through the cannula (T, Fig. 2) carrying the infusion fluid.

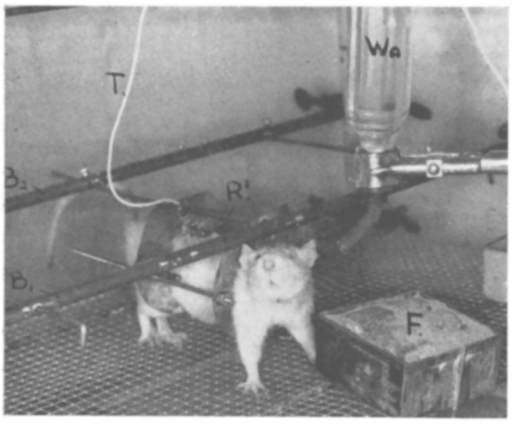

FIG. 2. Rat wearing harness. B_1; B_2 = Iron bars. T = Tubing carrying infusion fluid. R^1 = Iron rod. F = Food. Wa = Water bottle.

Results. 25 rats were immobilized by the double yoke harness and 22 of them had a continuous glucose infusion into the portal vein for 7 to 15 days, when they were freed of their yokes. The other 3 rats were not infused but were immobilized for 5 to 6 weeks. All animals appeared surprisingly healthy and clean at the end of their immobilization period.

Summary. A method has been devised for immobilization of small animals in a metal double yoke harness to carry out prolonged infusions. The harness is well tolerated and permits a degree of movement necessary for the well being of the animal.

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