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⁴ Hendrix, J. P., *J. Pharm. and Exp. Therap.*, 1940, **68**, 22.

rate of white rats 15.7% as determined by the method of Richards and Collison.⁵

In continuation of our experiments with delvinal sodium, we thought that it would be of interest to determine its effect on the basal metabolic rate of rhesus monkeys (*Macaca mulatta*), since this drug is being used clinically. A new method, which was devised by one of us (S.A.P.),⁶ was used. The apparatus provides a continuous photographic record of the rate of O₂ consumption from which the metabolic rate at any instant can be calculated.

Ten normal monkeys were used in this series of experiments. The diet for the last meal, previous to performing an experiment, consisted of fruits and vegetables (apples, bananas, oranges, cabbage, lettuce, and tomatoes). The feeding took place between 4:00 p.m. and 5:00 p.m.; then the monkeys were allowed to fast until the end of the experiment the next afternoon. All tests were begun between 9:40 a.m. and 10:40 a.m. and due to the character of the last meal, the animals were very probably postabsorptive about 12 to 15 hours before the basal heat production was determined.

The monkeys were weighed and placed in the chamber to determine the O₂ consumed. This preliminary control period ranged from 1.5 hours to 4 hours, in order to obtain a record free from activity. Then the animal was removed from the chamber and weighed again before it was injected intraperitoneally with a freshly prepared 2% solution of delvinal sodium. When anesthesia set in, the animal was placed back in the chamber and a record was again made of his O₂ consumption. This experimental period varied from 2.5 hours to 5.5 hours. The depth of narcosis was determined on removal from the chamber and at intervals thereafter. The rectal temperature was taken before and after the control period and after final removal from the chamber. The bath which surrounded the chamber varied from 25.4° to 28°C during the control period and from 26.3° to 29.2°C when the anesthetized animal was in the chamber.

The surface area was calculated from the Meeh⁷ formula $S = KW^{2/3}$. The value for K was determined by Lee and Fox⁸ to be 11.7 for rhesus monkeys. A respiratory quotient of 0.82 was assumed arbitrarily and the caloric value for one liter of oxygen was taken as 4.825 calories. The average value is only about 11% higher

⁵ Richards, A. N., and Collison, L. W., *J. Physiol.*, 1928, **66**, 299.

⁶ Peoples, S. A., *Science*, 1941, **94**, 373.

⁷ Meeh, K., *Z. f. Biol.*, 1879, **15**, 425.

⁸ Lee, M. O., and Fox, E. L., *Am. J. Physiol.*, 1933, **106**, 91.

TABLE I.
Respiratory Metabolism of Normal Rhesus Monkeys Before and After Administration of Delvinal Sodium.

Animal No.	Control period			Experimental period					On removal from chamber				
	Wt in kg	Rectal temperature	Cals./sq.m./hr	Rectal temperature after	Wt in kg	Dose in mg/kg	Degree of narcosis when placed in chamber	% change in cals./sq.m./hr at the following intervals after injection with delvinal sodium			Rectal temperature	Degree of narcosis	Wt in kg
								120 min	150 min	180 min			
27	3.759	103.6	31.1	102.8	3.645	35	DSA	—18	—19	—	101.2	LSA	3.607
28	4.716	102.5	29.9	101.9	4.665	30	LSA	—18	—16	—16	101.0	VLA	4.642
30	4.335	103.8	32.5	102.9	4.250	35	LSA	—12	—9	—10	102.4	LSA	4.217
33	3.161	103.6	28.7	102.1	3.117	40	DSA	—11	—13	—17	99.6	DSA	3.102
35	2.795	103.7	29.9	102.3	2.757	40	DSA	—34	—35	—36	97.8	DSA	2.743
36	3.077	102.4	26.4	102.0	3.003	40	LSA	—25	—25	—26	98.4	DSA	2.993
38	2.649	102.2	30.9	102.2	2.615	40	DSA	—31	—32	—31	100.2	DSA	2.603
43	3.907	103.1	33.2	103.0	3.819	40	LSA	—15	—16	—11	102.9	LSA	3.794
44	3.036	103.1	32.6	101.7	2.998	45	DSA	—8	—7	—7	101.2	DSA	2.986
48	2.830	103.0	29.5	102.9	2.788	45	DSA	—21	—22	—23	97.8	DSA	2.768
Average		103.1	30.46	102.3				—20.3	—19.4	—20	100.2		

than those reported by Bruhn⁹ and about 20% higher than those reported by Rakieten.¹⁰ The monkeys were not trained in the apparatus and none of the experiments were performed at night as suggested by Bruhn⁹ so that the control values may be slightly higher than the true basal rate.

The data that were obtained during the control period and during the period following the administration of the delvinal sodium, are shown in Table I. The metabolic rate changed so slowly during the narcosis resulting from the delvinal sodium that the instantaneous values at the arbitrary times selected give a graphic picture of the smooth curve obtained. The degree of anesthesia was difficult to judge but the following criteria were adopted: (1) deep surgical anesthesia when there was no response to any stimuli, (2) light surgical anesthesia when there was reflex response to a severe pinch in the flank, and (3) very light anesthesia when there were no voluntary movements but when a painful stimulus temporarily caused co-ordinated movements.

It is interesting to note that there was a significant decrease in the oxygen consumption in every animal that received delvinal sodium. However, this decrease in oxygen consumption does not seem to be related to either the dose of the drug or the drop in rectal temperature during the experimental period.

Summary. The average basal heat production of ten normal rhesus monkeys was 30.46 cal/square meter/hour. The O₂ consumption was decreased by doses of 30 mg to 45 mg of delvinal sodium/kilo of monkey. The 40 mg and 45 mg doses/kilo produced surgical anesthesia that lasted for about 3 hours to 5 hours.

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Blood Enzymes after Ligation of all Pancreatic Ducts.*

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Ligation of the pancreatic ducts of dogs is soon followed by a rise in the concentration of blood amylase which has been assumed by

⁹ Bruhn, J. M., *Am. J. Physiol.*, 1934, **110**, 477.

¹⁰ Rakieten, N., *J. Nutrition*, 1935, **10**, 357.

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