

maintain a constant body temperature was completely lost and shivering could not be elicited. Such an animal exhibits a remarkable release from control of the heat loss mechanism. Continuous polypnea and cutaneous vasodilation supervened. The respiratory rate varied with the activity of the animal, decreasing below 100 as a rule during sleep and ranging around 150 per minute (without the mouth being open) after activity. A mere pressing of the tail elicited typical panting (mouth open and tongue out) with a rate over 180. Such preparations have been maintained for 2 weeks without any change in this picture, suggesting that we are probably dealing with a true release phenomenon, since the picture supervenes as soon as the animal recovers from anesthesia.

These observations indicate that the chief central mechanism controlling heat production is located in the hypothalamus, and that extirpation of this region releases the heat loss mechanism, located elsewhere, from coordinated control.

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Effect of Carbon Arc Irradiation on the Goitre Producing Substance in Plants.*

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(With the technical assistance of Catherine Bender.)

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The occurrence of a seasonal and annual variation in the goitre-producing power of cabbage and other plants has been previously reported.¹ At that time it was suggested that sunlight might be a factor in bringing about the synthesis of some substance in the cabbage responsible for the production of goitre. Freshly harvested cabbage, from a source which had previously been known to produce active goitrogenic plants, was finely divided, spread in layers from 1 to 2 cm. thick, and irradiated with a carbon arc for 20 minutes at a distance of 50 cm. The maximum intensity of the arc used was between 3500 and 4000 A. U. The cabbage was then fed to normal rabbits in quantities equivalent to 60 calories per kilo per day. The experiment was controlled by feeding hashed, unirra-

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¹ Webster, B., Marine, D., and Cipra, A., *J. Exp. Med.*, 1931, **53**, 81.

diated cabbage from the same source in equivalent amounts to a similar series of rabbits. All rabbits used in the experiment were injected subcutaneously with 5 mg. of potassium iodide one week prior to the beginning of the experiment, to insure complete involution of their thyroid glands. At the termination of the experiment, the condition of the thyroid gland was determined during life by its exposure under ether anesthesia. The animals were later sacrificed and the weight of the thyroid was taken at autopsy.

Table I shows the results.

TABLE I.
Rabbits fed 67 days.

Rabbit No.	Material Fed	Condition Thyroid at Termination (Operation)	Wt. Thyroid at Autopsy* mg.
22	Irradiated hashed cabbage	+++	575
23	" " "	++++	620
24	" " "	+++	480
27	" " "	+++	540
25	Plain hashed cabbage	++	320
26	" " "	+-	180
28	" " "	++	280
29	" " "	+	210

* The weight of the normal thyroid gland in our series of rabbits varies between 50 and 150 mg.

A second experiment was carried out under the same conditions except that a batch of cabbage with less goitre producing activity was used. The thyroid glands were exposed at operation but the animals were not later sacrificed. Table II shows the results of this experiment.

TABLE II.
Rabbits fed 96 days.

Rabbit No.	Material Fed	Condition of Thyroid at Termination (Operation)
45	Irradiated hashed cabbage	+++
46	" " "	+++
47	" " "	++
42	Plain hashed cabbage	+ ?
43	" " "	++
44	" " "	+ ?

It would appear that carbon arc irradiation increases the goitre producing power of cabbage. It would seem that light brings about a photochemical reaction in the plant with the consequent formation of the goitrogenic substance. This agrees with the suggestion of

Marine and his associates² that the goitre producing power of cabbage was due to its cyanogen content. Further experiments are in progress.

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Effect on Kidney Function of Ether, Ethylene, Ethylene and Amytal, and Ethylene and Avertin.

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Although the suppression of kidney function by anesthetics has been studied under various conditions there is yet considerable speculation involved in their selection when considered on this basis. Marx¹ has shown, in dogs, that higher dosages of amytal exert a strong anti-diuretic effect and cause retention of substances ordinarily excreted through the kidneys. The clinical observations of Emge and Hoffmann² indicate a suppression of diuresis for the 2 post-operative days following amytal. Bruger, Bourne and Dreyer³ consider that kidney function is more depressed with avertin than with amytal. Kugel⁴ and Bonsmann⁵ have reported marked variations in the anti-diuretic effect of various hypnotics.

The work reported here is an attempt to compare the anti-diuretic influence of some common anesthetics under conditions which may have a bearing on their clinical usefulness. Normal dogs were maintained for several days on a regulated intake of food and water while the total 24 hour excretion of urine, urea, chloride and phosphate was ascertained. The excretion of phenolsulphonephthalein (1 cc. of 0.6% solution intramuscularly) and water (20 cc. per kg. by stomach tube) was determined each morning over a 2 hour period. The volumes of urine secreted in the afternoon and night were also noted. (For convenience in catheterizing, female dogs were used after making a posterior vaginal slit.) Approximately constant amounts of food and water, given in the late afternoon

² Marine, D., Baumann, E., Spence, A., and Cipra, A., *Proc. Soc. Exp. Biol. and Med.*, 1932, **29**, 772.

¹ Marx, J. *Pharm. Exp. Therap.*, 1931, **41**, 483.

² Emge and Hoffman, *Am. J. Surg.*, 1930, **9**, 16.

³ Bruger, Bourne and Dreyer, *Am. J. Surg.*, 1930, **9**, 82.

⁴ Kugel, *Arch. Exp. Path. Pharm.*, 1922, **142**, 166.

⁵ Bonsmann, *Arch. Exp. Path. Pharm.*, 1930, **156**, 160.