indicating that only a slight oxidation, if any, occurred after its ingestion. The same amount of glucose, when fed to a fasting dog, resulted in a prompt rise in respiratory quotient.

On seeking an explanation of the fate of this substance it was found that amounts often larger than 50 per cent of that ingested were excreted unchanged in the feces. Often times diarrhea resulted following its ingestion, but even when this did not happen large amounts were found unchanged in the feces. Five to 10 per cent of the total amount ingested was usually found in the urine, during the first 6 hours after its ingestion, while no additional measurable amount was excreted in the later hours. The 30 or 35 per cent unaccounted for is probably excreted slowly in the urine or feces or may possibly in part be destroyed by intestinal bacteria.

In order to determine whether glucosane is capable of being utilized in case it were absorbed, it was injected intraperitoneally and subcutaneously in normal dogs. In both cases the glucosane was excreted unchanged in the urine, a complete recovery being obtained in from one to three days thereafter. These latter experiments confirm those previously discussed in indicating that glucosane can neither be changed to glucose nor oxidized as such in the dog. If glucosane be oxidized in diabetic patients it can be proved only by the demonstration of an increased respiratory quotient in the diabetic following its ingestion, coupled with the proof of its absorption from the alimentary tract and its non-elimination by the kidneys.

## 3001

### The prevention and cure of tetany by oral administration of magnesium lactate.

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It was demonstrated in a recent series of experiments[1] that strontium lactate administered orally to parathyroidectomized dogs greatly delays the onset of tetany, and may even bring

[1]Swingle, W. W., and Wenner, W. F., *Am. J. Physiol.*, 1926, lxxv, 372-8.

about a permanent cure if the treatment is long continued. Preliminary experiments, carried out in conjunction with the strontium work, indicated that magnesium salts act similarly to strontium. The present paper is concerned with this phase of the work.

If parathyroidectomized dogs are given a 5 per cent solution of magnesium lactate in 100 cc. doses three times daily by stomach tube, they may be kept free from tetany for long periods, occasionally for three weeks. Some of the animals may develop tetany after eight or ten days. Once tetany becomes manifest, and the serum calcium falls below 7 mg. per 100 cc., the magnesium exerts little effect except to allay the more violent symptoms, probably through its anesthetic effect. However, if the animal is fed a pint or more of milk each day, along with the magnesium, the tetany soon disappears, generally within three or four days, and if the milk is discontinued the dog remains normal and shows no tetany symptoms so long as the magnesium is administered. Examination of the serum calcium shows that the calcium has risen to 7.5 or 8 mg. per 100 cc., which is above the level at which tetany becomes manifest in dogs.

The experiments indicate clearly that magnesium, *per se,* exerts little influence on tetany except through its action in sparing calcium. Somehow, the magnesium prevents the serum calcium from falling below the tetany level. A striking illustration of the sparing action of magnesium on calcium is shown in the following experiment. Parathyroidectomized dogs were allowed to develop tetany and then given the regular magnesium treatment. The animals died within a few days although the more violent symptoms of tetany were held in check. On the other hand, if tetany dogs are given several hundred cc. of calcium lactate by mouth, and this is followed by magnesium treatment, many of the animals do not again show tetany symptoms. The calcium raises the level of this salt in the blood and the magnesium somehow serves to maintain the level above 7 mg. per 100 cc. In the absence of magnesium, the calcium level of the blood soon falls and tetany appears.

It is a curious fact that if magnesium treated dogs are kept free from tetany for forty days, a large per cent of them permanently recover from tetany and may be placed on a heavy meat diet without ill effects. Thus ten dogs were used in this experiment; animals 2, 3, 7, 8 and 9 completely recovered and read-

justed themselves to loss of their parathyroids. Dog 6 remained free from tetany for ten days after operation but escaped from the laboratory before completion of the experiment. All of the animals developed tetany some time during the experiment, for if the tetany symptoms did not develop spontaneously by the third week, the magnesium was discontinued and the animals were fed meat until symptoms appeared.

## 3002

## The menstrual cycle in the monkey; effect of double ovariectomy and injury to large follicles.*

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In the course of some experimental work upon the effect of injections of ovarian and placental hormones into monkeys, operations have been performed at several intervals of the menstrual cycle. In four monkeys both ovaries were removed; in a fifth, large follicles were injured. The effect of these operations upon the time of appearance and the duration of the next menses provide some evidence as to the cause and nature of menstruation.

The ovaries were removed from the first monkey on the first day of the menstrual cycle (dated from the appearance of bleeding). The operation apparently had little effect for the menses continued to the fourth day. No second bleeding followed this one during a control period.

Double ovariectomy was performed upon the second and third monkeys on the 10th and 14th days of the cycle respectively. At this time the skin of the external genital organs and surrounding regions was considerably reddened. Ovulation had recently occurred in both cases and the corresponding tubes were removed and the ova recovered.[1] Apparently typical menstrual bleeding

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[1] Allen, Edgar, PROC. SOC. EXP. BIOL. AND MED., 1926, xxiii, 381.