As demonstrated above, digitalization alone has a tendency to increase the cardiac creatine absolutely as well as relatively, while great hypertrophy[3] gives relatively a decrease although there is an absolute increase in the actual creatine content of the individual heart.

In 5 rabbits with only small perforations of the aortic sail there was little if any hypertrophy demonstrable by an increase of HW/BW ratio above the normal of 1.972 with its S.D. of 0.299. In these the creatine levels were the highest that we have obtained.

In 9 rabbits with lesions involving at least a whole aortic sail and with conspicuous cardiac hypertrophy there was a normal or elevated creatine percentage and consequently a considerable increase in cardiac creatine content. The digitalization seems to offset the creatine percentage drop of great hypertrophy.

8436 C

Attempted Reversal of Filarial Periodicity in Dirofilaria Immitis.

E. HAROLD HINMAN.

From the Department of Tropical Medicine, Louisiana State University Medical Center, New Orleans, La.

Since Manson[1] discovered the phenomenon of filarial periodicity in China numerous investigators have sought to elucidate its mechanism. Mackenzie[2] was the first to reverse this periodicity by inverting the period of sleep and activity and his success led him to the belief that the sleeping and waking states are primary factors in its production. Manson successfully repeated and varied Mackenzie's experiment and since then a number of investigators have confirmed it, including Low, Manson-Bahr and Walters.[3, 4] These workers pointed out, on the basis of very careful 2-hour sampling, that true reversal did not occur but an irregular periodicity resulted from the patient's changing his daily routine.

---

3 Decherd, G., Schwab, E. H., Herrmann, G., and Brown, W. O., PROC. SOC. EXP. BIOL. AND MED., 1935, **33**, 521.

1 Manson, P., *The Filaria sanguinis hominis.* London, 1881.

2 Mackenzie, S., Haematoehyluria. (Demonstration Pathological Society, London.) *Lancet*, 1881, 707.

3 Low, G. C., Manson-Bahr, P. H., and Walters, A. H., *Lancet*, 1933, 466.

4 Low, G. C., Manson-Bahr, P. H., and Walters, A. H., Further observations on filarial periodicity. *Lancet*, 1934, 531.

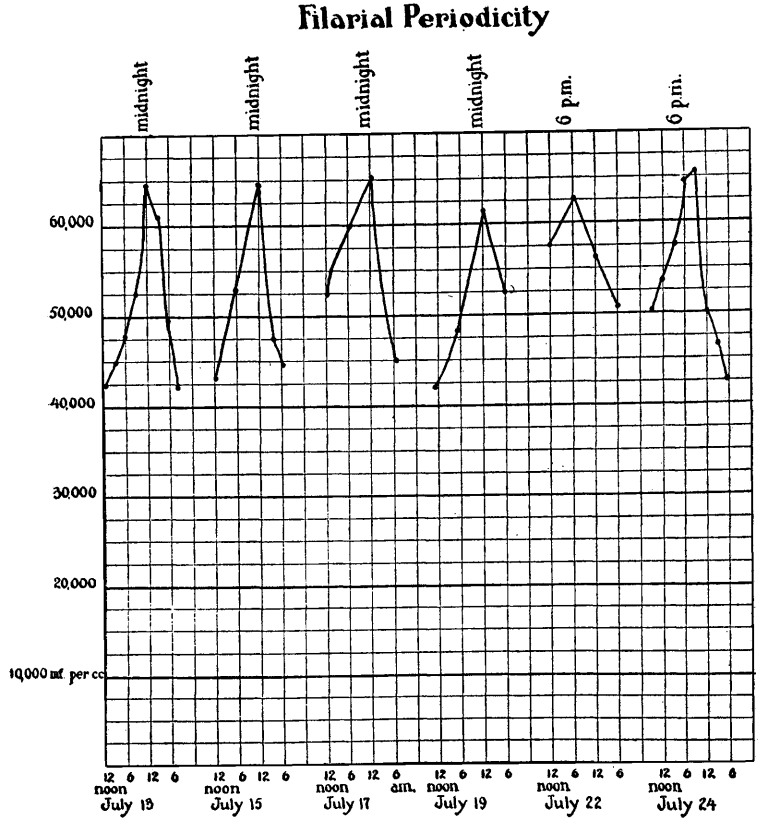
In an endeavor to shed some light on the mechanism of periodicity an attempt was made to reverse the cycle by changing the daily routine of filaria-infected dogs. Two animals were chosen for this experiment, one with a relatively high number of microfilariae (minimum of 40,000 per cu. cm.) and the other with only one-tenth this number. The animals were placed in separate cages, small enough to prevent much exercise, in a basement room without windows but ventilated by a fan system, run continuously throughout the experiment. Filarial counts were always made in duplicate, using 2 calibrated pipettes, which in the case of the dog with the heavy infection removed 8 cu. mm. of blood and in the one with the lighter infection 20 cu. mm. The blood sample was obtained by cutting the margin of the ear of the dog so that the blood ran freely and after duplicate samples were taken, bleeding was immediately stopped by pressure. It is essential that no clotting occur during the securing of the sample. The thick film technique was utilized for staining.

After a normal cycle had been obtained by taking samples every 3 hours for 24 hours, the dogs were kept in darkness and quiet from 6 A. M. to 6 P. M., at which time the lights were turned on. The animals were fed only once daily, at midnight. They were also exercised at this time and during part of the experiment, each animal had the run of a passageway for 6 hours during the night, either 6 P. M. to midnight or midnight to 6 A. M. They were also exercised during the night when blood samples were removed.

It is felt that in this experiment light and feeding habits would probably play the most important part. No means were available to make sure that the animals exercised or slept during the appointed time, but they were given the opportunity to do so. It was believed advisable not to administer hypnotics because of the possibility of their influence on periodicity. Exercise was enforced for short periods during the night when blood samples were taken. It was physically impossible to continue samples every 3 hours over a 2-week period so the intervals were lengthened to 6 hours for a portion of the experiment and alternate days omitted as shown on the graphs.

The experiment was begun on July 13, activity reversed on July 14 and continued through July 24. Thus for 11 days the dogs were kept in darkness during the day, under electric lights at night, fed at midnight and permitted to exercise at night. The influence of exercise would be difficult to evaluate without the use of a treadmill, which was not available. However, experimental dogs kept

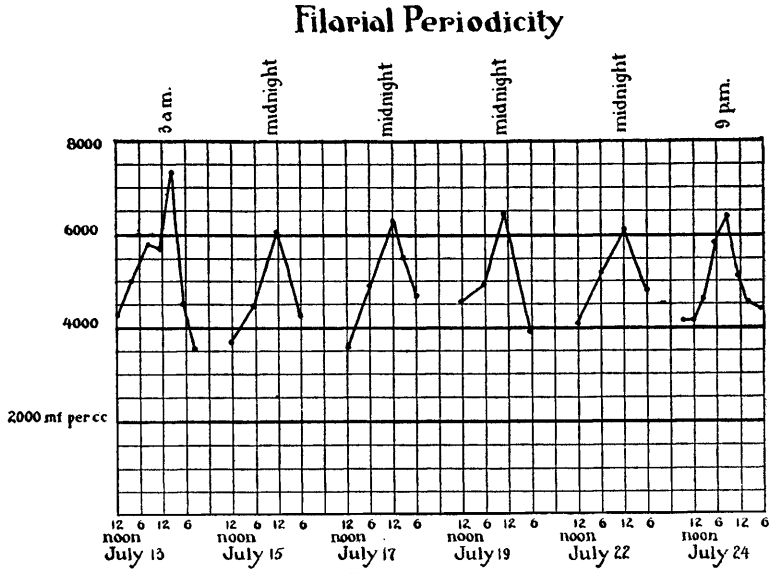
in relatively small cages, having no opportunity for real exercise, still exhibit typical periodicity. The quarters in which the dogs were kept had a rather constant, high temperature which approximated 80°F. throughout the experiment, the daily outdoor maximum at this time was 90-95°F.



GRAPH 1.

The results for Dog 1 are shown in Graph 1 and those of Dog 2 in Graph 2. At the start each animal showed a typical periodicity with a sharp increase in counts between 6 P. M. and midnight, when the peak was approximated. Between 3 A. M. and 6 A. M. a more marked decrease occurs. At the end of the experiment, Dog 1 showed a maximum at 6-9 P. M. with a decided fall before midnight (see July 22-24). Dog 2 on July 24 showed a relatively high count at 6 P. M. with the maximum at 9 P. M. In this animal there was also a sharp fall before midnight.

These results cannot be taken as a true reversal of periodicity,



GRAPH 2.

although the daily maximum has been moved forward about 6 hours. However, they do confirm the statement that alteration of daily routine exerts an influence on periodicity.

8437 P

Toxicity of Nembutal for Guinea Pigs.

EMMETT B. CARMICHAEL AND LOUIS C. POSEY.

From the Department of Physiological Chemistry, School of Medicine, University of Alabama.

The purpose of this investigation was to determine the average lethal dose of nembutal for guinea pigs, that is, the dose which kills 50% of a large group of the animals. All animals used on these experiments were normal and well fed. They were used only once.

The drug was injected intraperitoneally into 510 guinea pigs. The animals were divided into 4 weight-groups and the doses per kilo body weight of guinea pigs varied by 2.5 mg. increments from 42.5 to 67.5 mg. Table I summarizes the results.

The weights of the guinea pigs greatly influenced both the duration of sleep for those animals that recovered and the toxicity for