tragacanth (bacteria were killed at 80°C. for 10 minutes). At intervals of 12, 24, 48, and 72 hours following the protecting injections, a peritonitis was induced by the intraperitoneal injection of living *B. coli* suspended in 2½% gum tragacanth. Twenty-five control dogs were given similar injections of living *B. coli* in gum tragacanth. All the control dogs died. The percent of survivors of protected dogs was 40, 60, 80 and 75% respectively.

In spite of the peritonitis which was overwhelming in character and sudden in onset, the best survival percentage is 80 as contrasted with 65% by the former method. The material used for the production of peritonitis is several times the lethal dose for a dog of average weight.

Other experiments indicate that there is a quantitative relationship between the amount of the protecting substance and the percentage of surviving animals. There was a decreasing number of surviving dogs with a decrease in the number of bacteria composing the substance. These experiments also demonstrate that the gum tragacanth itself is not an important factor in the production of the peritoneal protection.

It was demonstrated previously[7] that the use of *B. coli* (culture 300) as a protecting substance resulted in survivals of animals with peritonitis induced by introduction of feces containing many and varied bacteria. Experiments with the protecting substance here described confirm the formerly expressed view.

Examination of the peritoneum of the animals injected with the protecting substance did not reveal presence of adhesions.

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Homolateral Synchronism of Lymphatic Hearts.

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It is a long recognized fact that the opposite members of each of the 2 pairs* of anuran lymph hearts do not beat in unison. There has apparently resulted a universal assumption that the same lack

[7] Steinberg, B., and Goldblatt, H., *Arch. Int. Med.*, 1928, **42**, 415.

* The posterior pair is of multiple origin, and in certain of the Salientia retains the separate character.

of unison exists between the anterior and posterior members of these pairs; that the several automatic spinal centers, which are known to deliver groups of nerve impulses rhythmically to the lymph hearts, operate each independently of the others[1] (Fig. 1, *a*).

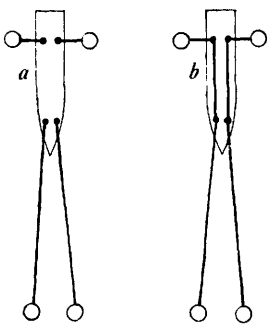

FIG. 1.

a. Schema illustrating the general concept of independent spinal automatic centers actuating the lymph hearts. *b*. Completion of the schema, expressing the discovered integration of homolateral centers. Black circles indicate spinal centers; circles in outline, the anterior (subscapular) and posterior (coccygeal) pairs of hearts.

Such independence, however, is discovered to be purely contralateral. A simultaneous mechanical record of the beats of anterior and posterior hearts *of the same side* reveals a strict correspondence of rhythm, in contrast to the obvious lack of synchrony registered at the same time by a heart of the opposite side (Fig. 2). The synchrony is remarkably stable, persisting even in extreme arrhythmia (Fig. 3). Spinal section between 4th and 5th vertebrae

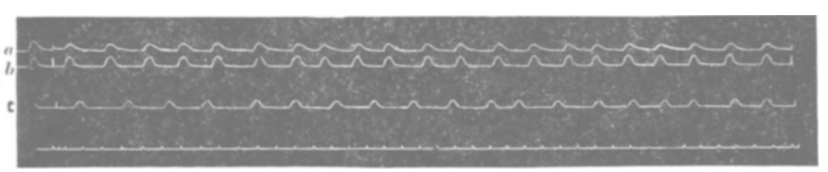

FIG. 2.

Simultaneous heart-lever tracings from lymph hearts of bullfrog *(R. catesbiana)*: *a*, right anterior; *b*, right posterior; *c*, left posterior. Time in seconds.

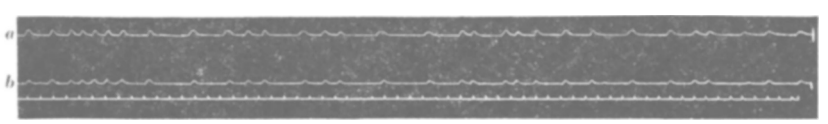

FIG. 3.

Synchronous beats with arrhythmia induced by a rising antero-posterior temperature gradient *(R. pipiens)*: *a*, left anterior; *b*, left posterior. Time in seconds.

[1] For account of amphibian lymph hearts, with recent literature, see G. K. Noble, The Biology of the Amphibia, N. Y., 1931, 195.

abolishes the unison but not the activity of the homolateral organs, while curarization or stimulation of one fails to influence the other. The synchronizing influence is therefore of central and not of peripheral (proprioceptive) origin.

Evidence indicates that the regions of motor outflow to the lymph hearts of the same side, in both larval and adult forms, are connected (Fig. 1, *b*) through an intraspinal pacemaker system effecting an exclusively homolateral coordination.

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Excretion of Lactic Acid in Sweat.

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The reaction, osmotic pressure and volume relationship of the body fluids are closely dependent on the properly regulated acid-base equilibrium. Under normal conditions 800 to 1000 cc. of fluid are lost through the skin in 24 hours; while under special conditions such as athletic contests, heavy work such as mining, etc., this may be increased to as much as over 3 liters per hour. Even under normal conditions there is a much greater amount of acid claiming excretion than fixed base taken in. During exertion this lack of balance between fixed base and acid catabolites is augmented and some regulatory mechanism is essential if the fixed base depots of the body are not to be abnormally drained. We have attempted to investigate how some of these regulatory devices operate to conserve base within the body during the excess sweating which takes place in patients whose temperature is raised to high levels for therapeutic reasons. These patients are taken at random and subjected to this therapy for causes as varying as acute gonorrheal infections, paralysis, psoriasis, etc., so that the results obtained are probably generally applicable and not due to the specific pathological condition.

The base economy factor of the skin will depend on its ability to produce a fluid of lower pH than the blood plasma which acts as the carrier of the catabolic products. The sweat as collected from the surface of the entire body at intervals after the temperature of the patients has been raised showed a pH of about 4-4.5. It is a known fact that athletes complain of "stinging sweat". The pro-