and the high mortality observed is suspected. Field studies are still in progress.

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THE ROUTE OF INFESTATION AND THE SITE OF LOCALIZATION OF LUNG-WORMS IN MOLLUSKS

THE proper study of the pathogenesis of the lesions in the lungs of vertebrates infested with lungworms is only possible, if we know the infestive stages of these parasites. From an economic point of view these stages have to be known to enable us to provide means for their control. Previously we demonstrated that a large group of lungworms of ruminants develops in certain pulmonata.[1,2,3,4] In the present work we wish to point out the route of infestation and the final site of localization of the parasites in their intermediate hosts.

The first stage larvae of these nemas, when brought in contact with the proper snails or slugs, bury themselves in the furrows of the sole of these intermediate hosts. A few hours later they may be seen entering the epithelial lining of the sole, after which they disappear in the layers of the muscular connective tissue of the foot. The pores of the foot glands facilitate this invasion, which takes place throughout the field of the furrows of the sole. The longitudinal sulci, if present, are preferred places of entrance. About twenty-four hours later the larvae coil up and the beginning of the formation of a parasitic tubercle is visible. Serial sections in transverse, sagittal and horizontal directions disclose that the nodules are restricted to the muscular connective tissue, which lays between and just above the foot glands. No further migrations can be observed. In the course of a few weeks the enclosed larvae molt twice and grow considerably. These larvae represent the infestive stages. The propagation of the parasites depends upon the ingestion at this stage of the intermediate hosts by the definite host. First stage larvae swallowed by the mollusks perish. Larvae entering the pedal cavity gland are rarely found.

The observations demonstrate that the localization of lungworms infesting mollusks is quite different from that observed for tapeworms or trematodes under similar conditions. They disclose a new type of infestation of mollusks with parasites of vertebrates.

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A SPECIFIC CONTAMINATION FOR THE PRODUCTION OF PSEUDO-RADIOACTIVITY

SOME years ago I was confronted by what seemed artificially produced radioactivity. After the impingement of high velocity electrons on a platinum plate in vacuum, this plate subsequently seemed to emit high velocity electrons. The rate at which this pseudo-emission took place decayed to half value in about five days. The two apparent elements of radioactivity were discharge against high voltage and exponential decay thereof.

The simple experiment warrants reporting only to save others from this false trail. There was formed on the platinum plate a hydrocarbon deposit about 20 molecules in thickness. The impinging electrons became entangled in the hydrocarbon deposit, and of course bound equal positive charges. The apparent releasing of high velocity electrons was only the manifestation of the release of the bound charges, entangled in the hydrocarbon deposit.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

A SIMPLE AUTOMATIC PUMP

IN some work with the heart-lung preparation, an automatic pump was necessary in order to circulate a varying flow of blood against a pressure of 100 to 200 mm of mercury, in a system closed to room air. The pump here described meets these requirements and is simple in design and can be constructed without special parts. With the materials listed below, it can be assembled in 45 minutes.

1—6″ length of 1″ glass tubing.
3—Rubber stoppers, No. 7.
1—Small bottle, diameter of mouth 1″.
1—Toy balloon, $\frac{3}{4}'' \times 3''$.
5—3″ lengths of 3 mm glass tubing.
Dental Rubber Dam.

The pump follows conventional design except for the substitution by a rubber balloon for the usual

[1] A. and M. Hobmaier, "Ueber die Entwicklung des Lungenwurmes Synthetocaulus capillaris in Nackt- Weg- und Schnirkelschnecken," *Muenchener tieraerztl. Wochenschrift,* 80: 36, 1929.

[2] A. and M. Hobmaier, "Limax und Succinea, zwei neue Zwischenwirte von Muellerius (Synthetocaulus) capillaris des Schafes und der Ziege," *Muenchener tieraerztl. Wochenschrift,* 80: 23, 1930.

[3] A. and M. Hobmaier, "Life History of Protostrongylus (Synthetocaulus) rufescens," *Proc. Soc. Exper. Biol. and Med.,* 28: pp. 156–158, 1930.

[4] A. and M. Hobmaier, "Elasphostrongylus odocoilei n. sp., a new lungworm in Black Tail deer (Odocoileus columbianus). Description and life history." *Proc. Soc. Exper. Biol. and Med.,* 31: pp. 509–514, 1934.

piston and cylinder, and the method of interrupting the outflow of air, which causes the blood to be forced out of the balloon.

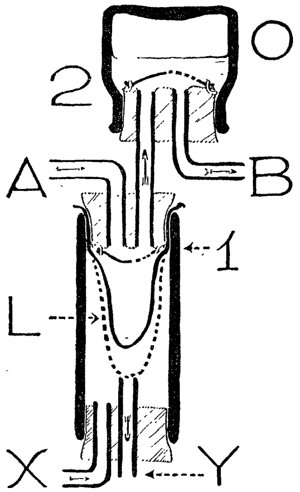

FIG. 1.

Compressed air flows from the main into the apparatus at X at a constant rate. Blood enters at A, flowing past the flap valve (1) and distending the balloon (L) forcing it down against the opening in the air exhaust tube (Y) and closing it off. A sudden increase in air pressure results and the tip of the balloon is held firmly against the opening in the exhaust tube. Then the blood inside the balloon is forced out past a second flap valve (2) into the bottle (0) which serves as an air cushion. As the hydrostatic pressure in the balloon (L) is decreased, the tip of the balloon is finally pulled away from the exhaust tube (Y) by the elasticity of the rubber wall of the balloon. Consequently, the air pressure in the apparatus is almost immediately released and air entering at the intake (X) again escapes from the exhaust (Y) at a constant rate. Within the range of its maximum capacity the speed of the pump is automatically adapted to the rate at which the blood is flowing in. When the inflow stops, the balloon does not fill and consequently the air exhaust (Y) remains open.

Flap valves, made of a portion of a toy balloon or, better yet, of dental rubber dam were found to be easily constructed and quite dependable. The rubber dam is sewed at its edges to the rubber stopper, being careful to allow enough slack so that blood flow is not impeded. As indicated in Fig. 1, the balloon (L) is slipped over the rubber stopper after the intake valve (1) has been completed.

Once the air exhaust tube (Y) is adjusted to the length of the balloon (L) and the optimum rate of air inflow determined, the pump works consistently with little attention. Our model pumps 600 cc per minute (about 10 cc per beat) against a hydrostatic pressure of 250 cm H_2O, with a pressure at the intake of about 20 cm H_2O.

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SPECIAL ARTICLES

TOXICITY OF NATURALLY OCCURRING ARSENIC IN FOODS

IT is well known that practically all marine life is naturally and inevitably richer in certain of the mineral elements than products from the land. The problem of the removal of arsenical spray residues from fruits and vegetables in order to make those foods safe for human consumption has recently focused the attention of investigators on the naturally high arsenic content of seafoods. Because of the increasing concern which is being shown by scientific workers at the present time the authors have undertaken to study the characteristics of the arsenic as it is contained in marine products when fed to laboratory animals.

Diets	Arsenic content of diets	Total ingested per rat (Milligrams arsenic as As_2O_3)		Total stored per rat (Milligrams arsenic as As_2O_3)		Per cent. of intake stored by rats	
	Mgm As_2O_3 per kilo	3 mo.	$5\frac{1}{2}$ mo.	3 mo.	$5\frac{1}{2}$ mo.	3 mo.	$5\frac{1}{2}$ mo.
Stock diet[1]	0.20	0.24	0.46	—	0.07	—	14.3
Stock diet + As_2O_3	17.90	19.78	36.32	3.73	3.58	18.8	9.9
High arsenic shrimp[2]	17.70	19.23	36.26	0.13	0.26	0.7	0.7
Low arsenic shrimp[2] + As_2O_3	17.90	19.60	36.27	3.57	4.25	18.2	11.7
Low arsenic shrimp[2]	1.20	1.29	2.49	0.11	0.18	8.1	7.1

1 Sherman Diet 13 modified by Russell.
2 The meat scraps (10 per cent.) of the stock diet replaced by dried shrimp.