TABLE 1

A COMPARISON OF THE LENGTHS OF THE ESTRUS CYCLES OF MATURE RATS IN THE WISTAR AND YALE STRAINS. RATS FROM THE TWO STRAINS WERE PAIRED ACCORDING TO AGE. RANGE 80–295 DAYS

Length of cycle in days	No. of rats showing cycle		P*
	Wistar 44 rats	Yale 44 rats	
3	7	5	
4	23	13	
5	10	11	
6	1	5	
7	2	3	
8	0	2	
9	1	3	
11	0	1	
14	0	1	
Average cycle in days ..	4.45 ± 0.13	5.48 ± 0.23	0.009
Percentage 3–5 days	91	66	0.00005

* Chance that deviation is due to sampling.

tural Experimental Station strain, and the Wistar experimental strain used in these studies are genetically different, as shown by the results of mating a piebald male with two Yale and two Wistar females. The 17 offspring from the Yale crosses were black with white paws and vest, while the 21 offspring from the Wistars were all piebald.

The data on the estrus cycle of the Yale rats have been interpreted as further evidence of a hyperfunction of the anterior pituitary in this strain.

BEN K. HARNED
VERSA V. COLE

WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA

LIFE HISTORY OF SPIRORCHIS PARVUS (STUNKARD) TREMATODA: SPIRORCHIIDAE

THE life history of *Spirorchis parvus,* a monostomate blood fluke from the arterioles of the muscular gut wall of the turtle *Chrysemys picta,* has been completed experimentally in the laboratory. The large non-operculate eggs contain active miracidia when passed from the host; hatching occurs after four to six days' incubation at room temperature. The miracidium is complicated, having a complex sensory apparatus, eighteen dermal plates arranged in four tiers and two pairs of flame cells. Miracidia penetrate young snails of the species *Helisoma trivolvis* Say and *H. campanulatum* Say and develop into elongated mother sporocysts in the mantle of the hosts. Young daughter sporocysts escape from the mother sporocyst sixteen to eighteen days after penetration of the miracidia and migrate to the liver of the snail by way of lymph channels. The young daughter sporocyst has a subterminal birth pore, a spinose anterior end, and contains several young cercarial embryos. The cercaria is an apharyngeal, distomate cercaria of the furcocercous, brevi-furcate type, having a dorsal body crest and compound pigmented eyespots. Body and tail are spinose. The body is humped above the insertion of the tail, broad posteriorly and narrow anteriorly to the ventral sucker. The mouth is subterminal as in schistosome cercariae; esophagus long, ceca short and inflated. The head organ is larger than the ventral sucker, the former is transformed within the final host into the oral sucker while the ventral sucker disappears. The tail-stem is muscular and more than twice the length of the body. The furcae have fin-folds. Both body crest and fin-folds are organs of flotation.

The crest is formed by an elevation of the cuticle above the dorsal mass, but the two cuticular portions are not in contact, thus forming a cavity between the apex of the crest and the dorsal body wall. The crest may be obliterated by extreme elongation of the body, or it may appear even higher than usual when the body is greatly contracted. It may disappear altogether when specimens are placed in hot fixing solutions, but it is demonstrable in specimens fixed in warm or cold solutions.

There are seven pairs of penetration glands in cercariae dissected from the snail, but only six pairs in naturally emerged cercariae. The seven pairs may be divided into four groups; the first group, found only in cercariae dissected from snails, consists of a single pair of small pyriform, mononucleated gland cells located about halfway between the eyespots and the ventral sucker. They and their ducts are filled with coarse granules. The second group contains two pairs of eosinophilic glands, located just anterior to the ventral sucker. The three pairs of glands in the third group are basophilic in staining reaction and are located dorsal and posterior to the ventral sucker. They are larger, more elongated and have more finely granular contents than the first two groups. The fourth group consists of a single pair of large glands located in the extreme posterior part of the body. In naturally emerged cercariae they appear as a single large granular mass and are so reported in related cercariae. The contents of these glands and their ducts are coarsely granular as in the first pair. During most of the developmental period of the cercarial embryo these glands are clearly separate. They migrate posteriorly from near the head organ, where they were first seen, to the posterior end of the body as the embryo grows into a fully developed cercaria. By this time the glands are so overlapped as to appear as one, but their ducts, which may be observed at any stage of development after their first appearance, indicate the paired condition. The presence of the first group of glands in cercariae dissected from snails and their absence in naturally emerged cercariae sug-

gest that the contents of the first pair of glands are used by the cercaria to make its way through the tissues of its snail host.

The identity of *Cercaria parvus* was proved experimentally by rearing adult worms from cercariae and also by rearing cercariae from eggs produced by these adult worms. A detailed comparison of this species with descriptions of *C. wardi* Miller (1923) shows that they differ only in the presence of a dorsal crest on *C. parvus*. A corresponding structure was not described for *C. wardi*. Despite this apparent difference there is a possibility that they are identical. *C. parvus* in its position when floating or resting on the bottom differs from *C. elephantis*, which it closely resembles in structure.

A more complete description of the stages in the life history of this trematode and the development of its excretory system will be presented elsewhere. These researches were supported by a fellowship of the General Education Board.

LIMAS D. WALL
DEPARTMENT OF ZOOLOGY,
UNIVERSITY OF MICHIGAN

SCIENTIFIC APPARATUS AND LABORATORY METHODS

AN AUTOMATIC ZERO PIPETTE FOR DISPENSING STERILE CULTURE MEDIA[1]

AN apparatus constructed in this laboratory in connection with chemical studies on the nature of disease resistance has proved to be convenient in sterilizing and aseptically dispensing measured amounts of liquid culture media into sterile flasks. It is particularly useful when large numbers of flasks are to be filled, as in testing the inhibitory effects of organic compounds using the alcohol sterilization technic described elsewhere.[2] The details are shown in the figure; the measuring device resembles the automatic zero pipettes commercially available but is especially adapted for aseptic use.

The apparatus was made of Pyrex glass throughout and requires one No. 7/25 Standard Taper joint and one three-way stopcock with 2 mm bore; the other parts are readily constructed by any one with an elementary knowledge of glass blowing.

To prepare the apparatus for autoclaving, an upright Erlenmeyer flask of appropriate size (generally 4 liters) containing the nutrient medium is closed with a two-hole rubber stopper bearing the measuring device and an air vent tube A. The stopcock is turned so that air can escape from the flask through the pipette and the openings are plugged with cotton as indicated. The L-shaped tube B leading to the stopcock is pushed as far as it will go into the rubber stopper so that a minimum of head room in the autoclave is required; the level of the liquid in the flask should be below the end of this tube. The air vent tube, which is made of a 2 mm capillary and extends to the bottom of the flask, is closed with a No. 0 rubber stopper to prevent loss of liquid through the tube; this stopper must be removed as soon as the autoclave is opened to prevent the solution from reaching the cotton plug. After the large stopper is fastened in place with the clamp, the top of the flask and the pipette are covered with a folded sheet of wrapping paper and the apparatus placed in the autoclave.

When the system has cooled and is to be used, the paper hood is removed, the stopcock turned to an off position and the L-shaped tube carefully pulled out of the stopper until the end is practically flush with inner surface of the stopper. The expanded rings C of the tube in the stopper aid in preventing any leakage or tendency of the tube to come out of the stopper

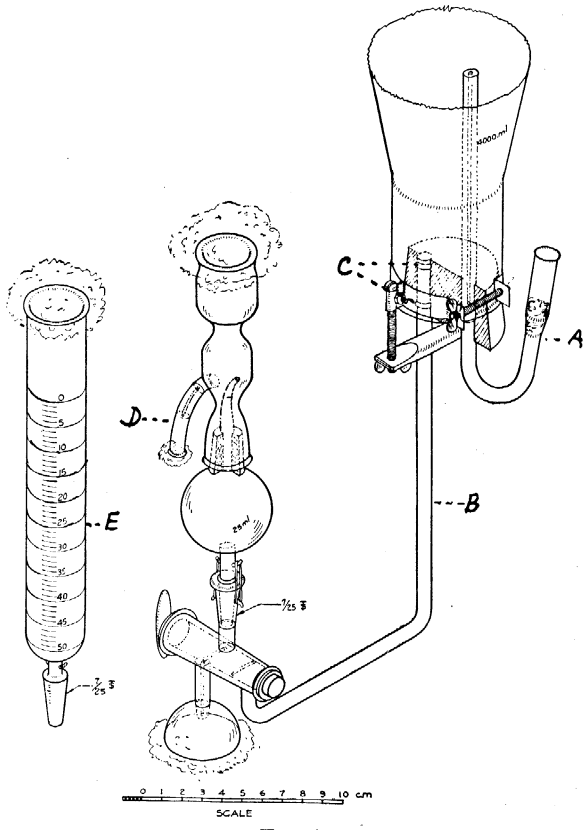

FIG. 1

[1] Approved by the director as contribution No. 598, Technical Series, of the Texas Agricultural Experiment Station.

[2] Glenn A. Greathouse and Neil E. Rigler. Quantitative Comparison of Methods for Sterilizing Solutions of Organic Compounds Used in Culture Media. (In press.)