

disputed problems of the past fifty years—namely, the problem of so-called parasymphylis, since it was this very idea that prompted me to undertake to search for *Treponema pallidum* in one form or another in the brains of general paralytics and in the spinal cord from cases of tabes dorsalis." And again, "I was led by the observation that *Treponema pallidum* sometimes assumes a granular form in cultures to re-study sections of parietic brains stained for the *pallidum*."

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ON THE RELATION BETWEEN THE TERMINAL-SPINED AND LATERAL-SPINED EGGS OF BILHARZIA.

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The final chapters of my report on the investigation into the mode of spread of bilharziosis in Egypt may not be issued for some time yet owing to my continued absence abroad. I have the kind permission of the editor of the *Journal of the Royal Army Medical Corps* to publish now a short summary of the results obtained in so far as they bear upon the etiological relation of vesical and intestinal bilharziosis and the explanation of the position of the spine in the eggs which give rise to these two distinct clinical manifestations of bilharzia infection. This question has been for years the subject of widespread discussion, but hitherto no finality has been reached.

The controversialists have arranged their arguments and facts around two principal theories.

(a) Looss's theory maintains that the terminal-spined eggs are the normal product of impregnated females of *Schistosoma haematobium*, while the lateral-spined eggs are those produced parthenogenetically where males have not developed.

(b) Manson's theory, based upon the constant and peculiar shape of lateral-spined eggs, their peculiarly limited geographical incidence, and their special selection for the intestinal tract, hypothesizes a zoological distinction in the adult parasites.

An examination of the fresh-water molluscs at El Marg during the spring and summer of 1915 showed that three species, *Bullinus contortus*, *Bullinus dybowski* (that is, the "*Physa alexandrina*" of Looss), and *Planorbis boissyi*, were infected with certain cercariae, which developed in mice under experimental conditions into bilharzia worms. These worms produced eggs of two kinds—namely, some with typical terminal spines and others with typical lateral spines.

By submitting individual mice, each on one occasion only, for a limited period to infection with the cercariae from single infected molluscs it has been possible to demonstrate that those developing in the *Bullinus* molluscs always produce bilharzia worms which give rise solely to terminal-spined eggs, while those which have developed in *Planorbis boissyi* always become worms which produce solely lateral-spined eggs. In all the experiments males developed and were more numerous than the females.

The cercariae found in *Bullinus*, although very similar to those found in *Planorbis*, showed differences in the suckers, in the relative length of tail, and in other minute points detailed in my final report. The adult worms experimentally reared also showed constant morphological differences. In the worms derived from *Bullinus* spp. the males have four or five large testes and the two lateral gut branches are late in uniting, so that even when mature the worms have a short intestinal caecum. In the female the ovary lies in the latter half of the body. The uterus is very long, voluminous, and contains many terminal-spined eggs, some of which lie in pairs. The yolk glands have a limited range in the posterior fourth of the body. These worms belong to the species *Schistosoma haematobium* (*sensu stricto*). In the worms derived from *Planorbis boissyi* the males are small, and have eight small round testes. The two lateral gut branches unite very early. In some of the smallest specimens found this union had already taken place. The intestinal caecum is correspondingly very long. The female has the ovary in the anterior half of the body. The uterus is very short, and almost invariably there is one egg only at a time in each specimen even when a number have already been laid. The yolk glands are extensive, ranging through the posterior two-thirds of the body along the whole length of the caecum. The eggs always have a lateral spine, the first laid is usually smaller than those succeeding, and the spine is then set almost at right angles to the long axis. Pending a consideration of the claims of other names to priority the specific name *Schistosoma mansoni* may be adopted rightly for these worms. They differ in their adult structure from *Schistosoma haematobium* (*sensu stricto*) more markedly than does *Schistosoma bovis*.

Vesical bilharziosis and Manson's intestinal bilharziosis are therefore etiological properly regarded as entirely distinct diseases.

IODINE IN TETANUS.

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WHILE the value of iodine as an antiseptic has recently been the subject of discussion, no reference has been made to the well-established facts that iodine possesses the power of rendering tetanus toxin non-toxic, and that such a modification of this toxin can produce active immunity.

An example of this effect is shown in the first table.

TABLE I.—Results of Injecting Subcutaneously into Guinea-pigs a Mixture, consisting of Equal Parts of Gram's Solution of Iodine and of Tetanus Toxin, some of which had been kept at 36° C. and some at Room Temperature for Different Periods before Injection.

Weight of Guinea-pig in Grams.	Quantity of Mixture Injected.	Time and Temperature.	Day after Inoculation.							
			1	2	3	4	6	10	14	
340	1 c.cm.	2 hrs. at 36° C.	—	—	—	—	—	—	—	—
380	1 c.cm.	2 hrs. at R.T.	—	—	—	—	—	t	—	—
340	1 c.cm.	1 hr. at 36° C.	—	—	—	—	—	—	—	—
365	1 c.cm.	1 hr. at R.T.	—	—	—	—	t	tt	tt	—
340	1 c.cm.	½ hr. at 36° C.	—	—	—	—	t	—	—	—
380	1 c.cm.	½ hr. at R.T.	—	—	—	—	tt	tt	t	—
375	1 c.cm.	¼ hr. at 36° C.	—	—	—	—	t	—	—	—
350	1 c.cm.	¼ hr. at R.T.	—	—	—	—	tt	t	—	—
355	1 c.cm.	At once	—	—	tt	ttt	+	—	—	—

R.T. = Room temperature.