As a preliminary to the systematic dissection of molluscs for developmental stages of trematodes it was thought essential to form a typical set of the various species of Egyptian Mollusca for reference. Through the courtesy of Major Flower and Messrs. Nicoll and Bonhote, we were given full liberty to make an exhaustive examination of the various ponds in the Zoological Gardens, Giza. These waters proved particularly rich in molluscan fauna, and, as will be noticed from the localities given under each species, provided typical examples of the bulk of the recorded forms.

Molluscs are, generally speaking, essentially aquatic animals, but a certain number are adapted to terrestrial life. The latter are of interest in relation to these investigations only in so far as they may be found living on the weeds overhanging the canals or dead in the mud dredged for aquatic forms. A certain number which came under our purview in this way are put on record.

The larval metamorphosis of all digenetic trematodes occurs without known exception in the bodies of molluscs belonging to the classes Gastropoda and Lamellibranchia, which are comprised in the grade Prohieripidoglossomorpha, and are alike distinguished by the possession of a visceral commissure, a foot wholly posterior to the head and a separation of direct communication between gonads and pericardium.

The large majority of trematode larvae develop in the Gastropoda. The Gastropoda are specially characterized by a univalve shell, an asymmetrical organization and a well-developed head, while the Lamellibranchia have a bivalve shell, an internal and external symmetry and a rudimentary cephalic region.

The shells collected are described in accordance with the classification set out in the following table; in every case the diagnosis

1 Now Captain, Royal Army Medical Corps.
is provisional and is based upon a comparative study of the material with the figures and description given by Pallary in his "Catalogue de la Faune malacologique de l'Egypte," published in Cairo in 1909.

**Class Gastropoda.**

**Euthyneura.**

<table>
<thead>
<tr>
<th>Opisthophanchia</th>
<th>Stylommatophora</th>
<th>Pulmonata</th>
<th>Basommatophora</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tectibranchia</td>
<td>Pupide</td>
<td></td>
<td></td>
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<tr>
<td>Nudibranchia</td>
<td>Succinide</td>
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<td></td>
</tr>
<tr>
<td>(marine forms)</td>
<td>Planorbiide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sedum</td>
<td>Physide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Succinea</td>
<td>Limnoide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calaxis</td>
<td>Ancylida</td>
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<td></td>
</tr>
</tbody>
</table>

**Streptoneura.**

<table>
<thead>
<tr>
<th>Aspidobranchia</th>
<th>Docoglossa</th>
<th>Rhipidoglossa</th>
<th>Aspidobranchia</th>
</tr>
</thead>
<tbody>
<tr>
<td>(marine forms)</td>
<td></td>
<td></td>
<td>(marine forms)</td>
</tr>
<tr>
<td>Neritida</td>
<td>Viminida</td>
<td>Paludimida</td>
<td>Valvatida</td>
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<tr>
<td>Ampullaria</td>
<td>Physida</td>
<td>Hydrobiida</td>
<td>Melaniida</td>
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<tr>
<td>Lanistria</td>
<td>Sinia</td>
<td>Hydrobiida</td>
<td>Melaniida</td>
</tr>
</tbody>
</table>

**Class Lammellibranchia.**

Eulammellibranchia—Subomytilacea—

<table>
<thead>
<tr>
<th>Cyrenida</th>
<th>Cycladida</th>
<th>Unionida</th>
<th>Mutelida</th>
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</thead>
<tbody>
<tr>
<td>Coricula</td>
<td>Pithillum</td>
<td>Nodula</td>
<td>Mutela</td>
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<tr>
<td>Cyclas (Spherium)</td>
<td>Eupera</td>
<td>Nodula</td>
<td>Spatha</td>
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<tr>
<td>Nodula</td>
<td>Lammelliana</td>
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<td></td>
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</tbody>
</table>

**Gastropoda. Helicida.**

*Helix (Hygromanes) obstruca*, Ferussac, 1821.

Common among the overhanging grass along the edges of the ponds in the Zoological Gardens at Giza.

![Fig. 56.—Hygromanes obstruca. (x 2.)](image)

Stated by Pallary to be common throughout the Delta, but not found by us elsewhere than above.
Helix (Cochlicella) barbara, Linnaeus, 1758.
Common in the Zoological Gardens, Giza, associated with Hygromanes obstructa.

Fig. 57.—Helix barbara. (x 2.)

Recorded by Pallary as not uncommon around Alexandria.

Eremina desertorum, Forskal, 1775.
Common on the Mokattam Hills east of Cairo. Is said to occur over the whole Desert of North Africa from South Tunis to the Red Sea. This species has a remarkable capacity of withstanding adverse conditions. A specimen stuck down on a tablet in the British Museum, 1846, was found to be alive four years later, and survived two more years. The Rev. A. H. Cooke kept ten examples alive in a tin box without food for eight years.

Fig. 58.—Eremina desertorum. (x 1.)

An additional point of interest attaches to this species from the fact that in all probability it was the one upon which the survivors of H.M.S. "Tara" are reported to have fed during their captivity with the Senussi near Sollum prior to their rescue by the Duke of Westminster's armoured car detachment in the spring of 1916.

Pupide.
Leucochiloides sennaaricus, Pfeiffer, 1855.

Fig. 59.—Leucochiloides sennaaricus. (x 3.)

Shells only, recovered from the fine mud dredged from the artificial ponds in the Zoological Gardens at Giza. Not frequent.
Teilhard has found it in abundance at Matarieh and occasionally in the Wadi Hoff near Helwan.

*Calaxis unidentata*, Jickeli, 1874.

Collected with *L. sennoaricus* from mud dredged in the ponds at the Giza Zoological Gardens.

![Fig. 60.—Calaxis unidentata. (× 3.)](image)

Reported as common at Matarieh and around Alexandria.

**Succinidae.**

*Succinea cleopatra*, Pallary, 1909.

(? *Succinea aegyptiaca*, Ehrenberg, 1830.)

Several specimens collected from reeds in marshy land on the desert side of the Ismailia Canal south of Bilbeis. A single example taken on the Sweet Water Canal near its connection with Lake Timsah.

Reported from the Mahmoud Canal and Lake Hadra near Alexandria, and from Nefisha near Ismailia.

![Fig. 61.—Succinea cleopatra. (× 14.)](image)

**Planorbidae.**

*Planorbis boissyi*, Potiez and Mchiad, 1838.

Next to *Bullinus dybowskii* this is the commonest mollusc in the small canals and ditches round Marg. We found it plentiful also on the road to Bilbeis from the south in a small canal running parallel to the Ismailia Canal. In the marshes to the south-west of the town of Ismailia it was also abundant. In other localities where we collected around Cairo and in the ponds of the Zoological Gardens it appeared to be entirely absent.
Pallary records specimens from the canals at Alexandria, at Samanoud and Cairo—"in a word, throughout Lower Egypt." From our experience, however, it certainly appears to have a very limited distribution as compared with Bullinus and other common forms in the Delta.

In the Sudan, where intestinal schistosomiasis is fairly common, this species has a wide distribution. Mrs. Longstaff has recorded finds at the following places on the course of the White Nile: north and south of Lake No; at Abba Island, Hilet Abbâs, Gebel En, Bahr-el-Zarâfa, and Hilet-al-Nûwêr. The Swedish Expedition collected numerous young examples at Gebel Ahmad Aga. These places are shown on the accompanying map.

Planorbis laurenti, Bourguignat, reported from Lake Timsah and from marshes near Ismâ’âlia, appears to be the same as P. boissyi.

P. boissyi is the intermediate host of Bilharzia mansoni in man in Egypt. The Cercaria of Bilharzia mansoni is shown in fig. 45. It harbours also the developmental stages of a second species of bilharzid worm believed to attain maturity in an aquatic bird.

Planorbis (segmentina) angusta, Jickeli, 1874.

A single shell of this species was given to us by Dr. Innes, from his collection made on the White Nile. We have found dead specimens in our field work. It is recorded from the shore of Lake Mariout, near Mex, Alexandria.
Planorbus mareoticus, Innes, 1884.

This small Planorbus is very common in the ponds at the Zoological Gardens and elsewhere in Giza. Specimens were frequently found at Marg.

Pallary says that it is found at Damanhour, Nefische, near Ismailia, and is very common around Alexandria.

Ancy is of opinion that this form is the same as P. ehrenbergi. P. mareoticus is the intermediate host of a cercaria believed to be the infective stage of a species of bilharzid worm occurring in aquatic birds.

Egg Deposition in Planorbidae.

Among the fresh-water molluscs at Marg we noticed two types of reproduction. There were certain forms like Vivipara and Melania in which the eggs were retained until development had taken place to such a degree that the progeny were provided with a shell showing already characters of the adult.

In other forms, such as Bullinus and Planorbus, the eggs were found deposited in flat jelly-like masses on weed from the bottom and sides of the stream. Not infrequently similar gelatinous masses were found on the shells of Planorbus and Bullinus. That these were deposited by the individual actually inhabiting the shell seemed little probable.
Bullinus contortus, Michaud, 1829.

Common in the ponds of the Zoological Gardens, Giza, at Marg, and on the Sweet Water Canal, usually associated with B. dybowskii.

Mrs. Longstaff has found it at Lake Shambe and at Masran Island on the White Nile. It has a very wide range, being reported from North, West and South Africa, Abyssinia, the Euphrates, and South Europe.

B. contortus is one of the intermediate hosts of Bilharzia haematobium (sens. strictu) in man in Egypt.

Bullinus dybowskii, Fischer, 1891.

Very common in the ponds at the Zoological Gardens, at Marg, on the Sweet-water Canal and generally in the canals and birkets.

Teilhard records it from Matariieh, and Pallary notes its occurrence in the collections of Lhotellerie from around Alexandria. This form is said by Pallary to be that provisionally named by Dr. Innes Physa alexandrina and appears in the lists of Sonsino and Looss under this synonym.

B. dybowskii and B. alexandrina are intermediate hosts of Bilharzia haematobium (sens. strictu) in man in Egypt. The cercaria is shown in fig. 47.

Bullinus innesi, Bourguignat.

A number of specimens found associated with the two pro-
ceding forms at Marg. Teilhard obtained specimens at Matarieh and Lhotellerie from the Mahmoud Canal near Alexandria.

![Bullinus innesi](image1.png)

**Fig. 68.—** *Bullinus innesi.* (× 2.)

*Bullinus innesi* on some occasions was found infected with cercaria of *Bilharzia haematobium* (sens. strictu).

*Bullinus* (Pyrgophyta) *forskali*, Ehrenberg, 1831.

Fairly common in the canal in the village at Marg and in the small subsidiaries. It was apparently absent from the Zoological Gardens. It is stated by Pallary to occur throughout the course of the Nile. In the Sudan Mrs. Longstaff found a specimen alive in Lake Shambe, and Dr. Innes describes material from a marsh near the Blue Nile.

![Bullinus forskali](image2.png)

**Fig. 69.—** *Bullinus (Pyrgophyta) forskali.* (× 2.)

*Bullinus* (Physopsis) spp.

Pallary considers the records of the occurrence in Egypt (Damanhour) of this sub-section of the genus *Bullinus* as referable to young specimens of *Physa acuta* and *P. subopaca*.

(?) *Physa acuta*, Draparnaud, 1805.

Some specimens collected from a pond north of Suez and submitted for diagnosis by Lieutenant-Colonel A. Balfour, C.M.G., appear to belong to this species. They closely resembled the species illustrated in fig. 70, but were twice the size.
Physa subopaca, Lamarck, 1841.
Fairly common in a small irrigation canal in the public gardens south of the outflow branch of the Sweet Water Canal passing through the town of Ismailia. A few examples got in Giza Canal. Found at Ismailia also by Letourneux, at Matarieh by Teilhard, and around Alexandria by Lhotellerie.

**LIMNEIDÆ.**

*Limnea cailliaudi*, Bourguignat, 1883.
At Marg, but not in very large numbers.

Letourneux obtained this species on the shores of Choubrak Island, a few miles to the north of Cairo. A small variety has been found at Alexandria and Ismailia.

*Limnea alexandrina*, Bourguignat, 1883.
Common in the Zoological Gardens, in the fountain of Shepheard's Hotel garden, and in the ponds in Esbekieh Gardens, Cairo; and in collections of water generally where there is considerable weed.
In marshy pools on the desert side of the Ismailia Canal near Bilbeis a peculiar variety [Fig. 72] of Limnea, differing apparently from those recorded for Egypt, was found in numbers.

(?) *Limnea truncatula*, Müller.

Found in large numbers in small irrigation channels on the Island of Gezireh, in the ponds in the Zoological Gardens, Giza, and in irrigation channels in agricultural land south of Bilbeis. This form, curiously enough, is entirely absent from Marg.

The specimens differ slightly, but apparently constantly, from typical examples of this species received from England, and there is some probability that the Egyptian material should be placed under a separate category. Pallary states, however, that *L. truncatula* and a variety *minuta* is found throughout the course of the Nile.

The occurrence of this form in large numbers in Egypt is apparently overlooked by Looss in his discussion on the carrier of the liver-fluke of sheep and cattle in Egypt.

**Ancyliidae.**

*Ancyclus clessini*, Jickeli, 1882.

A few specimens of this small limpet were occasionally found on dead leaves dredged from the bottom of the ponds in the Zoological Gardens, Giza. The species has been recorded once previously, and was collected by Lhotellerie at Alexandria.

**Paludinidae.**

*Vicipara unicolor*, Olivier, 1801.

Of constant occurrence in all our collections. Very common in the ponds at the Zoological Gardens and at Marg.

Stated by Pallary to occur throughout the course of the Nile and its tributaries.
Like other operculated forms it can survive for a considerable period without water.

There are a number of varieties, based upon colour and ridges on the shell.

*Cleopatra bulimoides*, Olivier, 1804.

Widespread in distribution and of common occurrence. Found in numbers in mud from canals, at the Zoological Gardens, at Marg, and elsewhere.

Stated by Pallary to occur throughout the course of the Nile. We distinguished specimens of this species provisionally from the succeeding form by the brown spiral marking of the shell.

*Cleopatra cyclostomoides*, Küster, 1852.

Common and found in association with the preceding form, from which we distinguish it empirically by its greenish uniform coloration.

There appears to be a number of varieties of shell types in *Cleopatra bulimoides*.

**Ampullariidae.**

*Ampullaria ovata*, Olivier, 1804.

Found only, but in considerable numbers, in the Bahr Yusef in
the Fayum. There are records of its occurrence in Lake Mariut and in the Mahmoudieh Canal near Alexandria.

**FIG. 76.—Ampullaria ovata. (x 1.)**

*Lanistes bolteni*, Chemnitz, 1786.

Fairly frequent in the Marg Canal in and beyond the village. Some examples dredged from the ferry across the Sweet Water Canal in the town of Ismailia.

**FIG. 77.—Lanistes bolteni. (x 1.)**

It is said by Pallary to occur along the whole course of the Nile.

**VALVATIDEÆ.**

*Valvata nilotica*, Jickeli, 1874.

This minute form occurs in numbers on dead leaves in the ponds in the Zoological Gardens, Giza. Examples were also collected from the large Giza Canal. It occurred only very occasionally at Marg.
Pallary has specimens from Alexandria, Cairo, and Suez. He states that it is distributed along the Nile and its tributaries.

FIG. 78.—Valvata nilotica. (x 2.)

HYDROBIIDÆ.

**Bythinia (Gabbia) sennaarica**, Parreyss, 1853.

About eighteen specimens in all occurred amongst the material collected from Marg. A few examples were found in the ponds of the Zoological Gardens, Giza, and a couple were dredged from the ferry over the Sweet Water Canal at Ismailia.

Pallary does not give specific localities, but says that it is distributed along the whole Nile. Mrs. Longstaff collected specimens from “ponds near the Pyramids of Gizeh” and at several places on the White Nile.

**Hydrobia stagnalis**, Linnaeus.

We failed to find this form. It is reported by Pallary to occur in Lake Mariout, Alexandria, and at Rosetta. Smith mentions its presence in Lake Qurun, Fayum, and Jickeli lists it for North-East Africa.

**MELANIIDÆ.**

**Melania tuberculata**, Müllner, 1774.

This is a very common form lying usually on the surface of the mud at the bottom of canals, ponds and birkets. It varies greatly in size. The largest forms collected were those obtained from the ponds in the Zoological Gardens.
Specimens were less frequent at Marg than Vivipara or Cleopatra. Pallary’s records are from the neighbourhood of Alexandria, from Asswan and from Suez.

In the bed of a small channel running from a spring into Lake Timsah between Ismailia and Ferry Post very large numbers of a small black variety were readily discernible on the sandy bottom.

Melania tuberculata harbours the developmental stages of a bilharzia worm believed to attain maturity in some aquatic bird.

**LAMELLIBRANCHIA.**

**Cyrenidae.**

*Corbicula consoberina*, Cailliaud, 1828.

In the mud of all the ponds and canals examined this bivalve occurred in large numbers. On the newly made banks of the tertiary canals, resulting from the annual removal of the mud from...
the bed of the canal, enormous numbers of dead and disintegrating shells can always be seen.

Pallary gives no locality but says that this species is very common in all the waters of Egypt.

**Cycladidae.**

*Cyclas (Sphaerium) teilhardi*, Pallary, 1909.

A few examples were collected from the ponds in the Zoological Gardens at Giza.

Pallary bases the species on material collected at Gabbari near Alexandria.

**Mutelidae.**

*Spatha rubens*, Lamarck, 1819.

A few examples of this enormous bivalve were dredged in the Zoological Gardens.

It is stated by Pallary to occur in the waters of the Nile and in the canals of the Delta.

**Unionidae.**

*Nodularia nilotica*, Cailliaud, 1823.

Frequent in mud from ponds in the Zoological Gardens and from the Ismailia Canal.

Pallary states that this species is rarely found in typical form, but it occurs throughout the course of the Nile.
Fig. 85.—Distribution of *Planorbis boissyi* in the Sudan.
ACKNOWLEDGMENTS.

The present section completes the account of the investigations in the field. These extended from February until July of 1915, and were continued, under the auspices of the Wandsworth Trust, from November until February of the present year. Throughout the whole period of my mission I enjoyed the full use of the laboratories of the Department of Biology and Parasitology in the Government School of Medicine, Cairo. I now desire to put on record my deep sense of gratitude to the school authorities, and particularly to the director, Dr. H. P. Keatinge, who took a keen personal interest in the progress of the inquiry. I was also indebted in the earlier stages to Dr. A. R. Ferguson, Professor of Pathology, and later to Dr. W. H. Wilson, Professor of Physiology, for their kind and helpful advice.

At various times I had to seek official information and expert opinion, which was always most cordially given, from a number of other Government departments in Egypt. Dr. Charles Todd, chief of the Bacteriological Institute; Mr. E. Hurst, of the Physical Science Department; Messrs. Lucas and Pollard, of the Chemical Laboratory; Mr. J. I. Craig, of the Statistical Department; Major Flower and Messrs. Nicoll and Bonhote, of the Zoological Service; Mr. Branch, Secretary of the Sultanieh Society of Agriculture; Mr. Adamson, chief of the First Irrigation Circle; and Mr. W. A. Maule, of the Egyptian Government Survey, are amongst those to whom I am especially indebted for help on particular aspects of the Bilharzia problem, as it presented itself in Egypt.

I take also the opportunity which presents itself here to acknowledge my obligations for the valuable help received from Drs. Cockin and Thomson. Dr. Cockin unfortunately met with an accident early in March, and was invalided home. Dr. J. Gordon Thomson devoted himself with single-minded energy to the laborious work of collecting and prospecting, and although he personally wished to join for general service in the Royal Army Medical Corps in May, he was good enough to remain with me until the beginning of July. A considerable number of the molluscs, figured in the present section, and of the cercariae listed, were accumulated through his labours. It was in one of his dissections that the cercaria of the Bilharzia mansoni was first recognized.

I have pleasure, too, in bringing under notice the valuable services given by W. McDonald throughout the whole year's work both in the field and in the laboratory. I have no hesitation in saying that it was mainly due to his sustained application and persistent loyalty in following out my instructions that the cercaria of
<table>
<thead>
<tr>
<th>Cercaria group</th>
<th>Host</th>
<th>Planorbis</th>
<th>Bulinus</th>
<th>Pyrgophyia</th>
<th>Physa</th>
<th>Limneu</th>
<th>Vivipara</th>
<th>Eupopatra</th>
<th>Lanistes</th>
<th>Bythinia</th>
<th>Melania</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Gasterostome</td>
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<td>(B) Monostome</td>
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<td>C. sp.?</td>
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<td>C. verrucosi</td>
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<td>(C) Amphistome</td>
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<td>C. pigmentata</td>
<td>C. pigmentata</td>
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<td>...</td>
<td>C. sp.?</td>
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<td>(D) Lophocerca</td>
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<td>(E) Distome—</td>
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<td>(1) Cystocercous</td>
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<td>C. pusilla</td>
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<td>(c) Xiphidiocercaria</td>
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**TABLE OF EGYPTIAN MOLLUSCS IN WHICH TREMATODE LARVAE OCCUR.**
Bilharzia haematobium was discovered. The sections showing the cercariae entering the skin and some of the illustrations in this report testify to his technical skill.

ADDENDUM TO PART II: ON ARMY PROPHYLAXIS.

In the spring of 1916 further experiments were made at the request of Surgeon-General Sir W. Babtie to determine the degree of protection afforded by a modified Jewell system of filtration which it was proposed to instal at various points on the Sweet-water Canal. This system consists in the addition of alum in a settling tank prior to filtration through sand about a metre in depth, and provides for six possible traps for the Bilharzia cercariae during the passage from the source to the consumer, viz.:

(a) In the settling tank
   (1) Time factor.
   (2) Exposure to oxygen.
   (3) Chemical action of alum.
   (4) Arrest from entanglement in the flocculent precipitate.

(b) In the filter
   (5) Arrest on the surface by the "vital layer."
   (6) Arrest due to depth of sand.

A working model was kindly supplied by Mr. McCroquidale, manager of the Cairo Waterworks, and the rate of flow, head of water and depth of sand were identical with those adopted for the field systems, the only difference being in the superficial area of filter and settling tank.

The following conclusions were formulated:

(1) The B. cercariae survive and remain actively swimming for a much longer period than the time (five to eight hours) that the water takes to pass through the settling tank.

(2) Oxygen has a stimulating effect on the cercariae and is a necessity for their continued activity.

(3) Alum in the dilutions used for sedimentation of canal water has no effect on the B. cercariae.

(4) The B. cercariae are not entangled in the flocculent alum precipitate. They are seen swimming freely in the supernatant fluid twelve hours after the addition of the alum.

(5) The "vital" layer, formed by the deposition of alum on the surface of the sand and the arrest of bacteria and fungi therein, does not arrest the B. cercariae. These were found to pass easily through the layer formed by the passage for half an hour of aluminized water taken from the settling tanks of the Cairo Waterworks. The same result followed in another test made by passing newly forming alum precipitate on a small area of sand for an hour, thus producing an abnormally thick layer. This too offered no
obstacle to the leech-like progression of the cercariæ, for they were found actively swimming in the filtrate twenty-four hours later.

(6) Finally, depth of sand presented no insuperable barrier, for very active cercariæ were found in the filtrate of our working model within one hour after their addition to the inflow of aluminized water, a depth of thirty inches of sand having been traversed in this interval. The sand was a sample of that ordinarily used by the Cairo Waterworks. Sand of the finest grain used in filtration was similarly tested and proved inefficient.

Mechanical systems of filtration, such as the Jewell system, depend therefore solely on the delay they interpose between the discharging mollusc and the consumer for the amount of protection they afford against bilharziosis. At Cairo the additional delay after the intake of water from the main stream of the Nile is about twelve hours, while at Ismailia under a different system the delay is about twenty-four hours. The uniform dispersal of the cercariæ in the filtered water has also to be borne in mind. The "time factor" in the life of the *B. cercaria* apparently affords a satisfactory explanation of the relative immunity of Europeans in those Egyptian towns where there is both a filtered and raw water supply.

Chemical systems of filtration, such as sodium bisulphate, are employed in many parts of the world. Two "tabloids" are dissolved in a quart water-bottle as a rule. Each "tabloid" contains 16 gr. (1 grm.). A dilution of 1 in 567 is quickly lethal to the bilharzia cercaria. These "tabloids" may therefore be used with safety in bilharzia-infected countries.

In view of its germicidal value, chlorine 1 in 1,000,000 acting for half an hour is in common use. This dilution would not have the requisite effect upon the activity of the bilharzia cercaria. It would be necessary to use two parts of available chlorine per 1,000,000, and afterwards to dechlorinate in order to render water taken from the canals and ditches in Egypt free from bilharzia infection.

For troops stationed on small outposts in the Delta safe water can be had, after two days, by improvising storage in tarpaulin sheets, etc. Where this is impossible the drinking water should be separated from ablution water and the former sterilized by boiling or by tablets of acid sulphate of soda. The ablution water may be rendered quite safe for immediate use by the addition of ordinary Army "Cresol" in the dilution 1 in 10,000, while 1 in 90,000 is sufficient if the water is kept overnight.

(To be continued.)