XXIII.

LARVAE OF THE FLY SARCOPHAGA (SARCO- PHILA) WOHLFAHRTII IN THE EAR.

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It is well known that the number of foreign bodies, both animate and inanimate, met within the external ear channel is very great. In every textbook of otology we find enumeration of all possible foreign bodies found within the external ear. Kerrison¹ in his book says "there is hardly a limit to the variety of foreign substances which may be introduced, either intentionally or by accident, into the external auditory canal." In the chapter on the foreign bodies in the ear the authors all emphasize the importance of skill and care in the removal of foreign bodies, stating that no foreign body can do so much harm as a careless and unskilled trial to get the foreign body at any price. Except in the textbook of Ballenger² I have nowhere found a notice that an animate foreign body—e. g., the larvæ of insects—can occasionally endanger the life of its victim, although in the majority of textbooks on otology we find mention of larvæ in the human ear.

As a curiosity I cite a statement of such an authority as Bezold,³ who in his textbook denies the possibility of the presence of larvæ in the human ear.

Nevertheless, it is a fact that at least one kind of fly, namely *Sarcophila* or *Sarcophaga*, described at first in the eighteenth century by a German physician, Wohlfahrt,⁴ can cause most severe pain and under certain circumstances may endanger life itself. Wohlfahrt had a patient 67 years of age, who for eight days suffered horrible pains in the head. The regions of the right eye and nose were swollen. There was epistaxis from both nares which lasted several days without cessation. One larva fell from one nostril, and when the patient, according to the advice of Wohlfahrt, poured some alcohol into the nose, 18 larvæ came out and all symptoms disappeared very soon.

Wohlfahrt examined the larvæ, and after some weeks of waiting there appeared a cocoon and a fly, which he has described and very instructively illustrated (Fig. 1). This observation for a long time remained unknown and the German entomologist Schiner described the same fly in 1869 under the name *Sarcophila magnifica*, without mentioning the description of Wohlfahrt. A prominent Russian entomologist, Portchinsky,⁵ claimed that this fly should bear the name of the discoverer and proposes to give her the name "*Sarcophila Wohlfahrtii*," or "*Wohlfahrtia magnifica*." In his very interesting monograph he gives all the data from the literature, describes the fly, its customs, and cites a great number of cases where the larvæ have penetrated into the human body, for the most part, however, into the ears, nose and eyes.

The fly is very common in Southeast Russia, in Southern Siberia and Turkestan. Its habitat is near herds of cattle, chiefly sheep, on which it deposits its larvæ (not eggs, but larvæ), for the most part in even the smallest wounds. The cattle owners in that part of Russia know very well the dangerous "worms" on cattle, from which the animals sometimes die, but, according to Portchinsky, they did not know that the worms are descendants of a beautiful big fly, grayish in color, which Portchinsky has repeatedly found in the neighborhood of the cattle. The fly appears only on hot sunny days; at other times it is hidden. The female flies have a very delicate sense of smell, and even the smallest wound attracts them. No wonder that when a child with a purulent discharge from the ear is sleeping in the open the fly, when present, will come very quickly and put her larvæ into the ear.

The larvæ when born are small, but very active, and grow rapidly. They have on the head end an apparatus consisting of three strong sharp hooks (Fig. 2), with which they penetrate into the tissues of the body and make deep, long channels, causing inflammation with profuse discharge. This discharge serves as food for the larvæ. In the second stage of the development they lose the middle hook, become quite large (up to 15 mm. length) and then leave the animal. Then they burrow in the ground, form a "false" cocoon and in two weeks a fly is born.

After this introduction I shall turn to the description of the cases observed and treated by me in the years 1915-16, when I was practicing in the Crimea. My first case came to me in September, 1916 (this month in the Crimea is very hot). During my office hours a whole Tartar family came to me, bringing a boy 10 years of age who was crying, yelling, groaning and clutching at his head. Sometimes he was even swooning. The parents told me that for four days the boy had not slept a wink, complaining of terrible pains in the ear, which had been discharging pus for three years (after measles). They had seen what they described as large worms in the ear. They removed some of them, but some are still there, and the country physician could not get them out by syringing with water.

The aspect of the left ear was awful. The whole auricle was reddened, swollen and very painful to the touch. In the meatus several larvæ were to be seen. When I tried to pick some of them with the ear forceps they burrowed quickly into the depth of the meatus and other larvæ came into view. The tragus and lobulus were covered with pus, blood and black spots. The mastoid process was tender on pressure, especially in the fossa mastoidea. The lymphatic glands on the neck was enlarged and swollen. Temperature, 102°. The pulse, weak, 130. The boy appeared to be very ill.

At first I tried to syringe the ear with water, but only one larva came out. Seeing such a thing for the first time in my life, I examined it with the magnifying glass and discovered the hooks mentioned above. The larva made quick movements with the head and whole body which did not cease even when I put the larva into H_2O_2 and alcohol. Knowing that olive oil makes the removal from the ear of living insects (bugs, cockroaches) easier, I filled the ear with oil, which I always have on my office table for softening hard cerumenous plugs. Some seconds after that the larvæ appeared, one after the other. The oil had closed their breathing organs, forcing them to escape from the ear channel. Altogether, eleven larvæ, about 10 to 12 mm. long, came out. The child at once became quiet and fell asleep. After careful cleansing I examined the ear and found very remarkable changes. The skin layer of the auricle and external ear channel was red and swollen, with small

excoriations. The remnants of the drum membrane were irregular in shape and covered with blood. In the large perforation I found one larva, which I removed with the ear forceps. This larva moved sluggishly. The malleus was in situ. The Shrapnell membrane was red, covered with blood, but no perforation. A strip of gauze moistened in the solution of liquor aluminum acetate was introduced and bandage applied. Next day the boy was very gay, stating that his ear was now quite well, but that he still has some pain in the ear at times. Temperature normal. No pain over the mastoid. After a week the perforation became smaller and two weeks later was replaced by a scar.

Obviously we had to deal here with absorption of pus from the drum cavity and antrum, caused by the presence of larvæ in the external ear. The larvæ were carried by a sarcophaga fly directly into the ear when the boy slept in the open on a sunny hot day. The chronic otitis after measles has, as we know, a tendency to be cured when proper treatment is applied. I think that the irritation of the edges of the perforated drum membrane caused by scarification accelerated the healing process.

The larvæ I sent for examination to Prof. Z. Mokshetsky (Mokrzecki), a Polish entomologist, the founder and director of the Crimean Museum of Natural History in Simferopol. He recognized them at once and was very pleased to find two larvæ still alive, from which he got cocoons and flies.

The same month I observed the second case, a Tartar girl, three years of age, with larvæ in both ears. The child slept in the open. Purulent discharge from both ears. I removed altogether 13 larvæ, with this difference, that I syringed the external ear channels with 2 per cent watery solution of chloroform. Chloroform, even in so weak a solution, kills the larvae very quickly, and is quite comfortable for the little patient. When applied per se it causes pain by burning the skin. In this case both drum membranes and ossicles were destroyed. After the removal of larvæ the child, who was yelling, crying, etc., as in the first case, became quiet at once. I saw her no more.

Next year (1917) I had three similar cases. All of them were children, and in all the chronic otorrhea was present. After removal of larvæ all these three cases recovered, although in one case the rise of temperature and weak, accelerated pulse, lasted for several days. In no case was an operation on the mastoid indicated, although in all I noticed a tenderness in the region of fossa mastoidea and a rise of temperature.

Among the cases cited by Portchinsky, we find two which ended fatally. In one case (larvæ in the ear, l. c. page 51) a boy 13 years of age, who had had otorrhea for a long time, slept outdoors and was infected by sarcophaga. Four days later, after terrible pains in the ear and in the head, the ear was syringed with milk and turpentine oil, and 30 larvæ came out. Nevertheless, the general condition of the boy became worse, and on the seventh day the boy died with symptoms of meningitis.

The second fatal case was that of a girl, 11 years of age, who suffered from ozena. After sleeping outdoors the child noticed discomfort in the nose, afterwards itching and pain, which grew worse every hour. Some days later a large quantity of stinking fluid escaped from the nose. After eight days of intense suffering the child died from meningitis. The post-mortem examination revealed large destruction in nasal cavities, which communicated with orbits. The eye muscles were destroyed. In the nasal cavities altogether 58 larvæ were found.

When we bear in mind that the sarcophaga fly produces, according to Portchinsky, 124 to 168 larvæ, which are very hardy and active, there should be no wonder that under favorable circumstances they may endanger the life of the victim. When, for instance, a dehiscence in the roof of the tympanum and antrum is present it is quite possible that in the absence of the drum membrane the larvæ can penetrate through the dura into the cranial cavity, causing meningitis directly. On the other hand, the larvæ may evoke the absorption of pus by blocking the external ear channel and thus cause an intracranial complication, if not removed at the right time. The best method for removal of larvæ is syringing of the ear with 2 per cent watery solution of chloroform.

REFERENCES.

1. P. Kerrison: Diseases of the Ear, 1911, p. 119.
2. Diseases of the Nose, Throat and Ear, p. 652. Ballenger writes about the Texas screw-worm fly (*Comptosmia Lucifla macellaria*), that this insect can be very dangerous to the life of his victim when the "worm" has penetrated through the bone into the cranial cavity, invading an ear affected with otorrhea.
3. Bezold: Lehrbuch der Ohrenheilkunde, 1906, p. 116. "In der Lehrbuechern finden sich auch durchgaengig Fliegenlarven erwachnt, welche neben foetider Otorrhoe in knoechernem Gehoergang und der offenliegenden Paukenhoehle zur Entwicklung gekommen sein sollen. Da ein derartiges Vorkommnis weder von anderen neueren Autoren noch jemals von mir gesehen worden ist, so ist wohl ein Zweifel darueber erlaubt, ob hier nicht Taueschungen vorgelegen haben, welche durch raschen Wechsel von Lichtreflexen in der Tiefe entstanden sind."
4. Wohlfahrt: De vermibus per nares excretis Nova acta phys. Akad. Caes. Leop., 1770, p. 277.
5. Portchinsky, I. A.: Wohlfahrtia magnifica Schiner sive Sarcophaga resp. Sarcophila Wohlfahrtii Petersbourg, 1916 (in Russian language).

Fig. 1. The Fly of Wohlfahrt (*Wohlfahrtia Magnifica*).
1. The larva (magnified). 2. The fly. 3. Antenna. 4. The larva (natural size). 5. The false cocoon. (After Wohlfahrt.)

Fig. 2. The head end of the larva, magnified (after Portchinsky).